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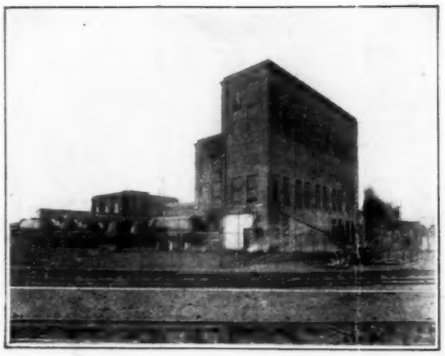

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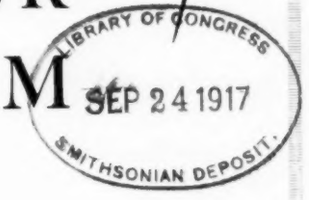

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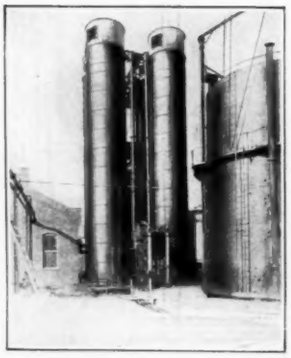

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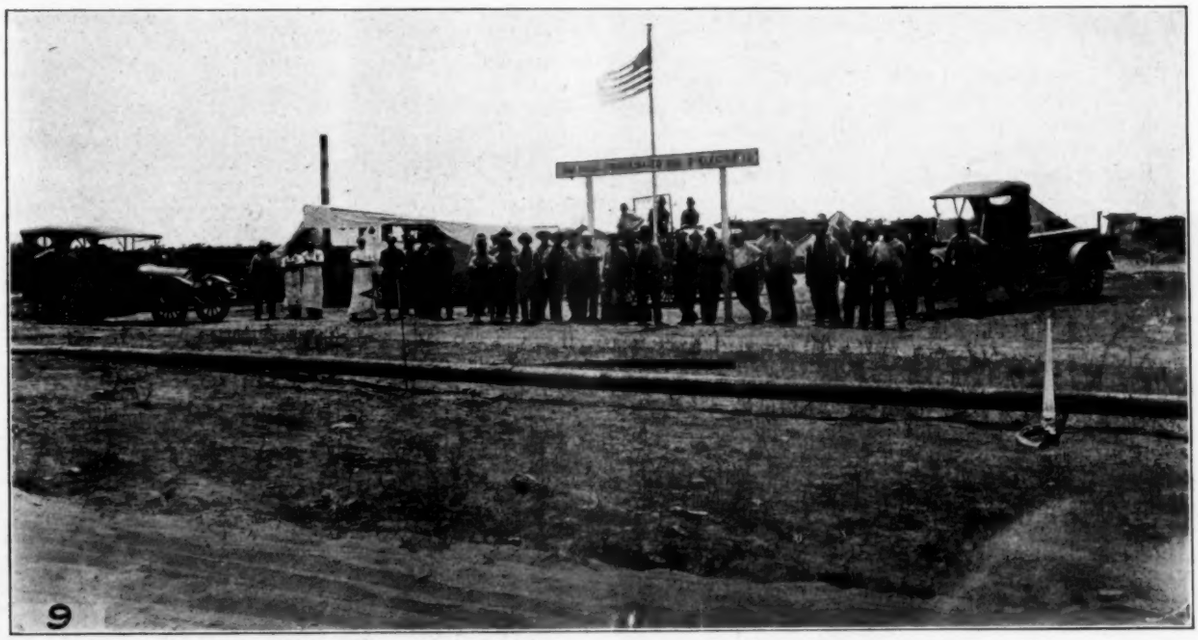

FIELD CAMP MAINTAINED BY COMPANY DURING CONSTRUCTION OF SUPPLY LINE

Gas Selected for Fuel Supply at San Diego Army Encampment

Policy of Gas Company in Adapting Its Methods to Fit In with Existing Army Regulations Previous to War the Stepping Stone by which the Larger Business Was Secured

By D. J. YOUNG

Superintendent, Gas Department, San Diego Consolidated Gas & Electric Company

In the early part of 1915 the Navy Department ordered the Fourth Regiment of Marines to go into camp on the grounds of the Panama-California Exposition, which was located in Balboa Park, almost in the center of the City of San Diego. This regiment comprised about 1,000 Marines. This being a field camp, the cooking was done with wood, and, then, on account of that being unsatisfactory, was done by coal. Representatives of the San Diego Consolidated Gas & Electric Company went to the authorities to try to get gas into this camp and found out that they were not allowed to buy gas ranges, and were limited on the fuel allowance. A careful study of the situation led us to believe that we could furnish them gas within their fuel allowance. We converted their coal-burning ranges into gas ranges and connected them up with gas. The use of gas at this point was extremely satisfactory and was continued by the regiment of marines during their stay

in San Diego, which was something over a year and a half; in fact, it is still being used by a detachment encamped at the same place.

Shortly after this the 21st Infantry, which was being used for border patrol, moved into another part of the Exposition grounds with a portion of their regiment. On recommendation of the officers of the marine regiment, the infantry regiment wanted to use gas. They were unable at that time to purchase stoves, and in order to get this business we had to loan them equipment. This we very gladly did and have connected them up with gas as fast as troops have been moved on our lines.

The early part of this year the City of San Diego loaned to the Government the entire grounds and buildings in the Exposition, to use as it saw fit. The Government decided to use this as a naval training station, and at present has a considerable number of sailors being trained at that point. The cooking for all of this military activity is being done with gas.

Getting the Big Camp Business

When it was decided to locate the big camp at San Diego, we immediately started after the gas business. Without going into details as to how this business was secured, we finally got them to agree to use gas at this camp, and in my opinion the main reason for the decision was the complete satisfaction of the service at the other military camps.

The camp at San Diego, which is called Camp Kearny, is located about fourteen miles from our plant and about nine miles from the nearest gas main. The estimated consumption of gas is about 60,000 ft. an hour. On June 30 we started to lay a 6-in. high pressure gas main to this camp, having promised the authorities that gas would be delivered at the camp between Aug. 1 and Aug. 5. This line was laid over very rough country. The mesquite and chaparral was about 8 or 9 ft. high, and so thick that one could scarcely walk through it.

In the accompanying cut, No. 1, shows truck going through the brush to break it down. Cut No. 2, method of breaking down the brush, using a railroad frog as a drag. No. 3, effect of one trip through with drag. No. 4, ground practically cleared ready for ditching. No. 5, plowing, using two trucks to pull the plow. No. 6, close view of the plow. This plowing was done with a "rooter," two furrows, and with a big share plow, two furrows, which gave us a ditch practically 18-in. deep, with most of the dirt thrown out. This is all the cover that we gave the pipe, as it is not subjected to very severe temperature changes and no traffic. Cut No. 7 will give a fair idea of some of the difficulties of the work, these two plows going up a very steep hill. Cut No. 8 shows a closer view. This main was laid for about a mile and a half, on the crest of this ridge, in order to get out of a bad canyon.

Also Supplies Contractor's Forces

The gas line up to the limits of Camp Kearny was completed and gas was turned on the fifth day of August. The distribution inside the camp proper, which comprises about 50,000 ft. of 4, 2 and 1¼-in. mains, is now being taken care of and will be completed in ample time for use by the government.

As soon as we got gas to the cantonment proper, the contractor who is building this cantonment, applied to us for gas for use at his camp. This camp was located at the north side of the cantonment about 5,000 ft. from the end of our line. No permanent pipes could be put across at this time, as the ground was all to be graded, sewer, water and gas lines to be put in and the houses erected. To furnish him we ran a temporary 2-in. main on top of the ground to his kitchen. This main we expected to have very hard service, so it was laid on the ground with plenty of slack and was made of standard 2-in. pipe with welded joints.

The grading contractor asked me what care should be taken of this pipe. I told him that they could go as far as they liked; if they hooked into it with the plow it would stop them, not hurt the pipe.

They are using for grading this work a 75-horsepower caterpillar engine and more than once when the operator of this caterpillar has been careless and allowed the plow to hook into this pipe, it has stopped the engine.

Now, as they are doing the grading, if the pipe happens to be in their way, they hook on to it with their tractor or mules and pull it out of the way. The line has been in service under these conditions for four weeks and has not developed a single leak.

The contractor's camp at present is feeding something over 1,500 men, all the cooking being done with gas, and we are now installing equipment for 1,000 more men.

Our experience demonstrates that if you have service that is valuable and can deliver the goods, it can be sold. When we first started talking gas to the various military authorities they intimated that it just couldn't be done. The fact that we at present are cooking for some four or five thousand men and expect within thirty days to be handling many thousand more shows that it can be done.

Experience Stamps "Request Maintenance" in Residential Lighting a Failure

E. B. Myers Declares Automatic System the Best Solution of the Problem—Object is to Anticipate Complaints

For some time the majority of the gas companies throughout the country have had in effect well organized systems for the maintenance of gas lamps in commercial establishments. These gas lamps under maintenance have given better service than those not under maintenance, asserts E. B. Myers in his paper on "The Growth and Present Status of Systems Used in the Maintenance of Gas Lamps in Residences," prepared for the convention of the Illuminating Engineering Society. How much good is accomplished by systematic maintenance has been clearly shown by a recent lengthy and thorough investigation made by the National Bureau of Standards. This investigation was extended over ten large cities in this country, and consisted in the examination of thousands of gas lamps in commercial establishments, some of which were under maintenance and some of which were not.

This investigation emphasized the common troubles which might be expected to be found with gas lamps not under maintenance, and brought out clearly how proper maintenance had been effective in keeping other gas lamps in good condition.

One System Generally Used for Commercial Lighting

A variety of schemes has been tried by the different gas companies in maintaining gas lighting equipments

ECONOMICAL METHOD OF CONSTRUCTING SUPPLY SYSTEM SHOWN STEP BY STEP

Block 1 Shows Motor Truck Going Through Brush to Break it Down; 2, Method of Breaking Down Brush, Using a Railroad Frog as Drag; 3, Effect of One Trip Through With Drag; 4, Ground Practically Cleared Ready for Ditching; 5, Plowing, Using Two Motor Trucks to Pull Plow; 6, A Close View of Plow in Action; 7, Plow Going Up a Very Steep Hill; Close View of Trucks and Plow on Steep Hill.

in commercial establishments. These systems have met with varied success, but naturally those meeting with the least success have been eliminated until now there seems to be one system generally used throughout for this work.

Customers may receive the service by signing a contract card which calls for maintaining the lamps in good condition, including cleaning glassware, making the necessary adjustments, and supplying all repair parts, such as mantles, glassware, etc.

It has been found by experience that calls made about every ten days are sufficient to keep the lamps in good condition, but, of course, additional calls are made where the case demands it.

The work is handled by a corps of men under the direct charge of inspectors. These men are primarily expert lamp men and are in no sense, nor do they act as, salesmen. They carry with them a sufficient supply of mantles, repair parts, etc., in addition to the necessary cleaning materials. The charges made for this maintenance depend upon the type of lamp and vary with the number of mantles per lamp.

The beneficial results obtained by the systematic maintenance of gas lamps in commercial establishments appealed so strongly to some gas companies that maintenance of some sort has been extended to cover the lamps in residences, and the results have been no less gratifying. It is but natural that schemes for the maintenance of residence lamps installed in different cities, while having the same object in view, should be worked out along different lines.

Request Maintenance a Failure

The earliest attempt to pay special attention to the maintenance of illuminating appliances in the home was simply to extend somewhat the scope of the complaint work already being done by the distribution department of the gas company. This resulted in what is called "Request Maintenance." By making the request to the gas company, any consumer could have a man call who would make any or all necessary lamp adjustments free of charge. If any material, such as globes, mantles, or lamp parts, was necessary, it was charged at regular prices. In other words, upon re-

quest, labor was supplied free of charge, the only cost to the consumer being for material.

It was soon found, however, that lamps in residences were in little better shape than before. The average customer would not avail himself of "Request Maintenance." He would probably first endure, and then become accustomed to, poor lighting conditions rather than immediately make the request upon the gas company. It was realized before long that, to make the maintenance scheme effective, it was necessary to take the matter out of the hands of the customer, and to have the inspection, adjustment, or repairs made regularly and automatically.

Automatic System

Probably the earliest attempt to put into effect such an automatic system was made at Toronto, Canada, and it has therefore been called the Toronto plan. In this plan, the gas company makes a house to house canvass of the city, so that each home is reached three times a year. By this means, every gas lamp in every residence is examined and adjusted, and the glassware cleaned. There is no charge to the customer for this work. Should it be necessary to replace broken mantles, broken glassware, or other lamp parts, this work is done then and there by the inspector, who carries a stock of replacements in a well equipped kit. These articles are supplied and installed at regular prices, there being no charge for the labor.

These inspectors are experienced men, carefully selected for their work. They are familiar with the disadvantages incidental to the use of antiquated, cheap or inefficient lamps, and are able to make suggestions resulting in the betterment of the illumination and often, at the same time, decreasing the operating cost. For example, a customer is advised to replace open flame burners with modern incandescent gas lamps. Where modern lamps are so placed that the illumination is improperly applied, changes are suggested which result in the proper application. Suggestions are made leading to the installation of proper shades or globes, tending to reduce otherwise high intrinsic brilliancy, with the elimination of glare.

Where, for any reason, the illumination has decreased gradually, the householder might not become aware of this condition because of the gradualness of the change. Moreover, should one of several gas lamps become inoperative where all are necessary for adequate illumination, the condition might be endured because of lack of initiative on the part of the householder. When the inspector brings these points to his attention, these conditions are often remedied.

Anticipating Complaints

The object of these regular maintenance systems is to anticipate complaints on gas lighting equipment, and thus insure to the customers continued proper illumination throughout the house. Moreover, these results can be obtained at no relatively high expense. It has been found that in operating the Toronto scheme, the profit made on the sale of new lamps, lamp parts, or mantles, by the inspector considerably reduces the cost to the gas company. This cost is further decreased if there is taken into consideration the fact that complaint work is often attended to by the inspector on the job which would otherwise have to be attended to by another gas company employee sent on a special visit. Then, too, when the maintenance system is in operation, the cost of ordinary complaint work (ordinarily done free by gas companies) on incandescent lamps is considerably lower than would be the case if the maintenance system were not in force.

Numerous gas companies have adopted this Toronto plan, or similar plans with slight variations. Equally good results have been obtained, and it is claimed that visits made three times each year are sufficient to keep the lighting equipments in the best of condition.

The Chicago Plan

In some localities, it has been thought well to put into effect a somewhat different plan, called the Chicago plan, so called because of its origination in that city. It is a selective plan.

Those customers who signify their desire for this service sign a contract by which lamps are maintained at the rate of 10 cents per lamp per month. Each lamp on maintenance is visited once per month, and is therefore kept in perfect condition. New mantles, lamp parts, or glassware, are supplied at no further expense to the customer.

The advocates of this plan are enthusiastic over the results obtained, but it has the disadvantage that all lighting equipments throughout the city are not visited regularly, as in the case of the Toronto plan.

In one city using a scheme similar to the Chicago plan, this disadvantage has been recognized and they have installed an additional maintenance scheme by means of which a house to house canvass is made each fall and every gas lighting equipment in the city is put in perfect condition, the customer being charged only for the material used.

Gas companies have long been of the opinion, and now the investigations of the Bureau of Standards have proved the fact, that gas lighting equipments maintained by the customer are not maintained at all. We emphasize a statement made by the Bureau of Standards, contained as one of the conclusions in their report: "When one recognizes the great advantages of maintenance to both company and customer, it seems that it would be desirable to have this service rendered to all users of gas for lighting."

A canvass of the gas companies of this country which has just been completed shows that more and more interest is being given by them to this subject of the maintenance of gas lighting equipment in the home. In fact, in a large number of cities, residential maintenance systems are now being operated and in many other cities such systems are in the process of being worked out. Those companies having experience with these maintenance systems are enthusiastic over the results obtained and it is hoped that all gas companies will take steps to keep gas lighting equipments in the home in good condition by the prompt installation of systematic maintenance schemes.

Increased Value of Coal in 1916 as Reported by U. S. Geological Survey

Figures compiled by C. E. Lesher, of the United States Geological Survey, Department of the Interior, show that the total value at the mines of the coal produced in 1916 was $867,125,638. Bituminous coal and lignite were valued at $665,116,077, an average of $1.32 per net ton, compared with $1.13 per ton in 1915, an increase of 19 cents, or less than 17 per cent. Pennsylvania anthracite was valued at $202,009,561, an average of $2.30 per net ton, compared with $2.07 per net ton in 1915, an increase of 23 cents, or 11 per cent.

Gas Company Using All Its Influence to Stop Sale of Cheap Burners and Mantles by Storekeepers and to Encourage Consumers to Buy All Their Supplies from the Company

William J. Serrill Enumerates Obstacles to Growth of Lighting Business—Declares Cause of Artifical Illumination Would Suffer if Use of Gas as Illuminant Should Greatly Decline—Tempted to State that Combination Company Is the Worst Enemy Gas Lighting Has

The cause of artificial illumination would suffer if the use of gas as an illuminant should be greatly curtailed, is the opinion of William J. Serrill, in his presidential address to the Illuminating Engineering Society. He bases this statement on the axiom that competition is a healthy state.

In his address he enumerated various obstacles that stand in the way of the full prosperity of the lighting branch of the gas business.

First to be considered is a lack of uniformity in the fuel delivered to the burner. This does not mean that only one quality or kind of gas should be made all over the country. Generally speaking, any of the gases that are in vogue anywhere are satisfactory, in the sense that existing types of gas burners may be adjusted to give efficient results with them. It does mean, however, that when burners are once adjusted and in use, it is highly desirable that the fuel thereafter fed to them be kept uniform.

It thus becomes a problem for the individual manager in each city or territory that is separately supplied. The modern gas burner, being a creature of small orifices and delicate adjustments, if it were endowed with the gift of tongues, and with a knowledge of what is expected of it, would cry "uniformity, uniformity," with every molecule of its structure.

Candle Power Standard the Principal Cause of Variation

In the past, two kinds of gases principally have been general—coal and water. In recent years coke-oven gas has become an important factor with many companies. These gases differ from each other in gravity, in heating power, and in air requirement, *i. e.*, the volume of air necessary to burn completely a unit volume of the gas. Many important considerations have led the larger gas companies to equip themselves with apparatus for making two of these gases, and to distribute a gas that is a mixture of the two. Under these conditions the maintenance of a desirable uniformity in the gas, at all seasons, is not easy.

The effort to maintain a standard candlepower as the one standard quality of the gas has been the principal cause of variability in the other qualities. This standard candlepower quality, now happily in process of abandonment, but still enforced in many cities by governmental ruling, or contractual agreement, can be maintained in the gas as delivered to the burners during the changing temperatures incidental to the seasons only by varying the proportions of the gases in the mixture, or by processes of enrichment; and these changes automatically cause those variations in the other qualities of the gas which are harmful to the cause of good gas lighting.

Candlepower as a quality of the gas is useful only on the open-flame burner. It has no value in the incandescent gas burner; on the contrary, the effort to maintain it introduces effects that are detrimental to incandescent gas lighting. Thus it is seen that the whole course of the development of incandescent gas lighting, since the first introduction of the Welsbach burner, has been retarded and handicapped by the enforced adherence to an obsolete and harmful quality in the gas.

The least efficient, the most wasteful, type of burner has been coddled to the positive detriment of that type on which the future of gas lighting depends. It is one of the bright spots in the future of gas lighting that this incubus is in process of abatement. By common consent, the gas industry is abandoning the candlepower standard, in favor of a heat-unit standard, for the gas. In many towns this transformation is an accomplished fact; in others—and these include some of the larger cities—it may not take place for several years.

Problem Demands Constant Attention of the Manager

However, even with this principal source of variability removed, the maintenance of a desirable uniformity in the gas is still a question demanding the constant attention of the manager. When working to a heat-unit standard, a uniformity of air requirement and of gravity is more easily maintained than under a candlepower standard, but it will not maintain itself. It will continue to exist only as the result of unceasing vigilance. Econonfic and labor conditions demand, for many cities, that a fairly standard quantity—sufficient for the summer output—of coal gas be made, and that the extra quantity for the winter consumption be supplied by water gas, made only during that season. This means a gas of varying qualities, and the problem confronting the manager in such cases is how to introduce these changes with the least possible effect on the incandescent burners—how to maintain a gas calling for a nearly constant air requirement, as the proportion of water gas intermixed gradually increases, and then, after reaching a maximum, gradually decreases with the approach of spring. Some of the ablest minds in the industry are now engaged on the different phases of this question.

Again, unexpected or unforeseen conditions sometimes arise, which tend to destroy uniformity. The present shortage in the coal market, due to the great war, may be cited as an instance.

This condition has forced some companies, which have been distributing water gas for years, to swing over to coal gas. In such a change the incandescent gas lights are bound to be affected, but with the absence of a candlepower standard to be maintained, and with a new sense of the importance of uniformity which the modern manager possesses, even such changes will pro-

duce a smaller detrimental effect on the gas lighting conditions than formerly.

Sending Out an Unscrubbed Gas

Another source of variability, of a type that is entirely inexcusable, arises out of the manager's failure to realize the serious effect produced by sending out, even temporarily, an unscrubbed gas, or one containing constituents that normally are removed. It usually arises in this way: Some alteration, replacement, or renewal in the gas manufacturing plant is undertaken, without any provision being made for the temporary treatment of the gas during the interval that elapses between the taking out of the old installation and the introduction of the new, on the assumption that, for so short a period, a gas that is not normally treated will do no harm. This state of the managerial mind, once quite prevalent, is growing scarce. He knows now that he may, in a few minutes time, by omitting precautions of the nature indicated, seriously affect his gas lighting business.

The candlepower standard has been an obstacle in the path of incandescent gas lighting, not only by tempting consumers to keep the uneconomical open-flame burners in use, because of the high candlepower of the gas, not only by rendering it impossible for the manager to distribute a uniform gas such as is demanded by the incandescent burner, but also by the psychological effect it has had on the gas manager himself. It has lulled him into a sense of false security. By tradition thinking largely in terms of the open-flame burner, the enforced maintenance of the candlepower standard, conserving a quality in the gas that is useful only on that type of burner, has emphasized this thought, thus measurably retarding the day, now happily dawning, when the manager faces about, and for the first time looks squarely in the face the requirements in the fuel that are demanded by a good incandescent gas lighting service. At no very distinct period in the past, all gas lighting was by the open flame. Gradually the incandescent type has replaced the open flame, but quite gradually, and by no means entirely, even to this day. The open-flame burner is indifferent to wide variations in the quality of the gas, so long as the candlepower is maintained. How natural, when a candlepower standard is in vogue, to rest comfortably in the thought that by maintaining this standard, one has done his whole duty by gas lighting! Fortunately, for the future of gas lighting, the manager now knows differently.

Belt Line to Secure Uniform Pressure on Low Pressure Systems

The demand for uniformity by the incandescent gas burner is not, however, completely met by the unbroken delivery of a gas of uniform quality. This uniform gas must come to the burner under uniform pressure. To variations in pressure are due many of the causes of dissatisfaction with gas burners. The rules of the Public Service Commissions of the several states usually provide a maximum and minimum pressure permissible at any burner, and an allowable degree of daily variation above the minimum. These provisions are seldom unreasonable. The gas manager well knows that the requirements of a satisfactory lighting service call for a variation considerably less in volume than the variation these rules generally allow.

Strictly uniform pressures are possible only on high pressure systems, with a governor on each service. Pressures approaching this ideal of uniformity may be obtained on low pressure systems, such as the majority of gas distribution systems are, by utilizing a system of feeder mains, or a belt line filled with pumped gas and provided with governor stations located so as to feed into the distribution system at numerous points. Such devices, of fairly recent introduction, enable the manager to maintain more uniform pressures throughout his territory than formerly, and to do so at a less charge for capital investment. The modern tendency to carry higher pressures generally, causes automatically a smaller percentage of daily variation in the pressure at any point in the main system. These causes, in connection with a keener appreciation on the part of gas managers regarding the importance of pressure variations as a factor in the gas lighting service, are gradually removing what has in the past constituted a serious handicap.

Greater ease in maintaining a uniform gas at the burner is not the only benefit the cause of gas lighting enjoys by the abandonment of the candlepower standard. An additional advantage lies in the smaller quantity of condensable hydrocarbons in the gas.

Traces of Sulphur in Gas

Adherence to the candlepower standard required the maintenance of a fair, sometimes a large, quantity of such condensable content, while compliance with a reasonable heat unit standard permits a material reduction of it. In a properly adjusted burner, the presence of such hydrocarbons in their normal vaporous form is unobjectionable, as they are completely consumed in the burner, but the seasonal variations in temperature—in the mains underground, in the basements, and in the interiors where lamps are located—whereby the temperatures in these three places vary so that each in turn may become higher than the other two—these seasonal variations bring about the condensation of part of these hydrocarbons and its deposit in liquid form.

The presence of this liquid deposit, becoming solid or semi-solid when subjected to burner temperatures, has in the past constituted a serious obstacle to a good gas lighting service. These deposits have been the cause of what is sometimes popularly called a "dirty" gas, now happily disappearing with the exit of the candlepower standard.

Compliance with a heat unit standard permits of a sufficient reduction in the condensable hydrocarbons to prevent any deposit under ordinary seasonal ranges of temperature, thus securing greater insurance against those lighting troubles which these deposits cause. Here again we see one of the handicaps under which incandescent gas lighting has labored, in process of abatement.

An evil incidental to the modern forms of gas lighting, which was not so objectionable with the open-flame burner, arises out of the presence of traces of sulphur in the gas, in the form of carbon bisulphide and several obscure sulphur compounds. The ordinary methods of gas purification, which effectively remove all traces of the ordinary sulphur compounds, do not touch these special combinations of sulphur. The burning of the gas, however, destroys them and liberates the sulphur in the form of sulphurous acid. The quantity so liberated into the atmosphere is so small as to be unobjectionable; indeed, the atmosphere of rooms lighted by gas does not show any higher percentage of atmospheric sulphur than does the ordinary atmosphere of our modern cities, which is charged with this substance to a greater extent than formerly by the com-

bustion of solid fuels in house furnaces and manufacturing processes.

However, while these traces of sulphur are negligible as vitiators of the atmosphere, their presence in the products of combustion issuing from gas burners, nevertheless, produces certain other objectionable effects which gas lighting would like to dispense with. It is a factor in increasing the discoloration of burners and fixtures, and of walls and ceilings, caused by the continual impingement of these products of combustion. If these products were absolutely devoid of sulphurous acid it is probable that the objectionable discoloration of burners and fixtures would be materially reduced.

Elimination of Darkening of Walls and Ceilings

The darkening of walls and ceilings, which constitutes one of the greatest handicaps under which lighting by gas suffers, is not caused solely by the sulphurous acid in the products. The presence of this compound, however, is a potent factor in causing it, and the complete removal of the sulphur would materially retard the growth of the stain, and also diminish its intensity. The removal from the gas of these obscure sulphur compounds is, unfortunately, not easy, and it is expensive. The subject is engaging the attention of the ablest chemists and engineers in the industry, and the outlook for the development of a feasible process of purification that will entirely eliminate them is by no means hopeless. If gas lighting is to hold its proper rank in the field of artificial illumination, the accomplishment of this object is important.

The elimination of condensable hydrocarbons from the gas, incidental to the transfer from a candlepower to a heat-unit standard, by removing a tendency to cause smoke due to clogging of orifices in the burners, is another factor lessening the evil of darkened walls and ceilings. Not anything that it is in the power of the gas industry to do, however, will entirely remove this objection. Caused by the impingement of atmospheric dust carried by warm air currents, this effect is seen above, or near, any object whose temperature is such as to induce currents of air. The effect is proportional to the volume of the current and the length of time during which it impinges, assuming an equally dusty atmosphere. Insofar as the gas burner generates a large quantity of heat, it cannot avoid the impingement of a correspondingly large volume of the dust-laden air.

It can look for relief from this trouble only in a reduction of the quantity of dust and dirt in the atmosphere, or by an increase in the efficiency of light production. In residences, especially those of the better class, in which this evil is more objectionable than elsewhere, there is reason to expect in the future a more dustless atmosphere, due to the introduction of a gaseous house-heating fuel, to the more general use of vacuum cleaners instead of brooms, and to cleaner city streets. In passing, it is worth noting that less dust in the air in residences will have another beneficial effect on gas lighting, in that it will retard the accumulation of the burner gauzes, and thus lengthen the period between maintenance visits.

Ignition and Distant Control

Second only to the handicap of discolored walls and ceilings, if indeed not of equal importance, are the problems of ignition and distance control. These have to do with the factor of convenience, an attribute of prime value. They are recognized as problems of fundamental importance, and there is no need for me to dwell on them in this place. Mechanical and chemical inventiveness have accomplished much in the efforts to solve them, and there is reason to believe that the end has been reached.

An obstacle to the full development of gas lighting is a practice still followed generally by gas companies, which is based on a policy which the industry has drifted into, rather than consciously adopted. This is the practice by which the open-flame—the least efficient—burner is given away freely to consumers, while the various forms of incandescent—the most efficient—burner are only sold at a profit. This practice places a handicap on the introduction of the incandescent burner, while obviously it is the true interest of the industry, in its competition with other forms of lighting, to facilitate the introduction of its most efficient appliances. It is not difficult to trace the path of this now mistaken policy. When all gas lighting was by the flat-flame burner, gas companies generally adopted the then liberal policy of giving these burners, without charge, to consumers. The expense was small, and the inducement to the consumer thus created was worth while. The replacement of the flat-flame by the incandescent burner has been a gradual process; the adherence to the candlepower standard has, as already explained, kept the flat-flame burner in an undeserved relative prominence; and the gas manager, as in all long-established industries like the gas business, has been conservative.

Thus this old practice has continued by virtue of its own momentum.

Of course there was less objection to it when gas lighting, even by the flat-flame burner, was less expensive than competing forms of lighting, but since this margin has grown smaller, or has disappeared, this practice has become increasingly unjustified. And yet it is generally followed to-day. Some progressive companies are now charging for flat-flame burners, and are shaping their new-business policies so as to throw every inducement in the way of the consumer to use nothing but incandescent gas burners; and there is little doubt that gas companies generally will follow suit.

Appliance Maintenance

The subject just considered brings us naturally to another, which is matter for serious concern to gas ligthing interests. The gas industry has not shown itself able to control the quality of its incandescent lighting appliances. Inefficient, poorly designed and constructed burners, and flash mantles, constitute a very serious evil. And yet it is only within a comparatively recent date that the industry may be said to have considered it seriously. The national societies are now wrestling with the problem of standard designs and specifications of burners and mantles. So far, within my knowledge, no gas company has thought it worth while, in order to control this situation, to make free installations of standard burners, or even of standard mantles. In time, competition may bring them to it.

Some companies, however, are using all of their influence to reduce, or altogether to stop, the sale of cheap burners and mantles by storekeepers in their cities, and to encourage their consumers to purchase all of their supplies from the companies. The fact that gas mantles, of a kind, may be made by relatively un-

skilled labor, and in plant requiring so small a capital investment, is a detriment to the cause of gas lighting.

Relations with Plumbers

Still another question of mistaken policy, inherited rather than adopted, comes to mind. It has to do with the relations between gas companies on the one hand, and plumbers and gas-fitters on the other. In order to facilitate and promote the introduction of gas cooking and other fuel appliances, gas companies generally have long followed the practice of including the connection with the sale of the appliance, and of installing the piping connection by their own workmen. Again, while many gas companies have refrained from installing in new houses, at the time of their erection, the complete piping system for gas lighting, leaving this work to the plumbers, still, even in the lighting field, the desire to promote installations has led many gas companies to include in the sale of burners any piping that may be needed to hang the burners. This piping work done by the companies has, as a rule, cost the consumers less than the plumbers can afford to do it for. This practice has resulted in the plumbers and gas-fitters feeling that the gas company underbids them, and injures their market. Instead of every gas-fitter in town being a friend to the gas company and a promotor of gas lighting, as he should be, too often he is indifferent, or actively unfriendly. Within a recent period the unwisdom of this situation has been appreciated, and at least one of the larger companies has adopted a policy the reverse of the traditional one.

Poor Illuminating Engineering on Part of Salesmen

Generally poor illuminating engineering on the part of the gas company's salesmen may be fairly cited as one of the handicaps to which gas lighting is subjected. Many causes contribute—the salesmen are paid by a method which induces them to increase their sales at any cost, or by a method which induces them to select for sale, not the burners which are best for the location, but those which return the best pay to themselves, or campaigns are undertaken, in which only one type of burner is offered, or the salesmen are insufficiently instructed in the principles and practices of illuminating engineering, or to practise illuminating engineering would require a more careful study of the conditions than the salesmen have time for.

It may, however, safely be said that these conditions tend to improvement. Salesmen generally are receiving more thorough instruction in illuminating engineering; they are as a class better experienced in its practice. One of the national societies has inaugurated an excellent course of instruction for them in this subject. Gas managers, largely through the influence of our own society, are more keenly alive to its importance.

During recent years there has grown a conviction in the industry that gas companies should inaugurate systems by which their employees would visit consumers' premises to examine and maintain their gas lighting appliances. Some systems of this nature are in operation at the present time.

A Neglected Means of Advantageous Publicity

It may seem grotesque to include the backwardness of the gas industry in promoting street lighting by gas as constituting in any sense a handicap. Yet it is worthy of a brief consideration, as it marks a failure properly to utilize an effective means to publicity.

Any article appealing to universal popular favor, no matter how excellent in itself, cannot hope to achieve its greatest success minus this indispensable ingredient. Such is the nature of the public; it pays to advertise.

Ornamental lighting by gas, appropriate for parkways, boulevards, and the show places of cities, is entirely feasible, and if it is undertaken by gas companies as an advertisement and means to publicity, and not as a means of making money, there is reason to believe that much of it may be secured. So long as there is slight or no demand, it is natural that but few properly artistic fixtures should be available.

The Effect of the Industrial Wave

A condition that, in one way or another, has had a retarding effect on the progress of the gas lighting business may be expressed in the word "rates." Long accustomed to sell their product at a rate that was uniform under all conditions of use, gas men are at this day only novices at the difficult and delicate art of rate making. While differential rates for gas are of more importance to the industry in the fuel end of its business, still its slowness in utilizing this efficient means of increasing sales, and reducing costs, has undoubtedly had a retarding effect on the progress of the lighting end. A realization of this fact is spreading rapidly.

Commenting on an unfortunate effect the realization of the value of the industrial load has had on the lighting branch, Mr. Serrill expresses himself as follows:

"I have reserved for the last the most serious obstacle that threatens gas lighting to-day. As might be expected, it is an internal enemy, not one that menaces from without. It is indifference. Is the effort to promote gas lighting, to extend it in the face of active competition, especially in view of the splendid prospects of the fuel end of the business, after all worth while? For one cause or another, this paralyzing doubt is but too common among gas men. In the face of it, how can the gas lighting business expect to progress? Circumstanced as it is, nothing but positive, vigorous, enthusiastic effort, exerted by men who really believe in it and are determined to make a success of it, can maintain its standing, and secure its healthy growth."

"A potent cause for the unfortunate condition I am now considering," he further declares, "is what is known as the 'combination town,' where the electric and gas undertakings are controlled in one interest. I feel tempted to say that the combination town is the worst enemy that gas lighting has.

"In the various combination towns, as they exist in different parts of the country, one of three different policies seems to control. (1) Either the combination company does not actively push either its gas or its electric business, on the ground that having only a limited sum to devote to canvassing, it pays best to spend this sum respectively on the fuel and power ends of its two lines, because no matter what kind of light the consumer may want 'we get it anyhow'; (2) or the company frankly pushes the sale of the electric light alone, alleging that a given sum spent in canvassing in the gas field yields a far larger return in the fuel, than it does in the lighting end of the business; (3) or finally, the company actively pushes both its electric and gas light-

ing, sending its canvassers out in competition, as though the two were operated separately.

"There can be little question as to which of these courses is the best from the viewpoint of the most extensive growth of artificial illumination. It is the demoralizing effect on the gas men operating under the first two conditions, and the enervating influence exerted by these men on their fellows in the business, which are deplored. Here are gas men, belonging to gas associations, and attending gas conventions, who frankly have no interest in gas lighting, or who are completely indifferent as to whether their consumers use the gas light or the electric light! Is it any wonder that indifference has reared its ugly head amongst us? When two natural competitors cease to compete, the general cause they both serve is bound to suffer."

Many Factors Should Be Taken into Consideration in Illuminating Engineering Publicity

G. H. Stickney Criticises Present-Day Methods—Basis of all Advertising is Confidence—Taking Equipment into Consideration in Designating Lighting Performance of an Illuminant

The basis of advertising is confidence, declares G. H. Stickney in his paper on "Illuminating Engineering Publicity," prepared for the correspondence convention of the Illuminating Engineering Society. Unless the reader believes in the advertising much, if not all, of its effectiveness is lost. If there could be a way of guaranteeing all advertising so that all readers would rely on it, the economy and effectiveness of business transactions would be enormously enhanced.

Illuminating Engineering Claims

Improvements in the art of lighting often depend for their merit—economic and otherwise—upon quantities and qualities which are not readily and accurately measurable.

Style, taste, psychological and physiological reactions are so intimately involved with physical measurements that their evaluation presents many difficult problems.

However, ignorance, prejudice and misconception are the bases of most untrue or exaggerated claims.

While advertisers seem sometimes to be intentionally careless in ascertaining the facts, in order to avoid their limitation, there appear to be relatively few instances where deliberate misrepresentation is resorted to.

Fortunately, deliberate misrepresentation is dangerous and, therefore, rare. The task of combating it is an unpleasant one, but a duty that must sometimes be performed for the protection of the art.

Comparisons

There is a strong tendency among manufacturers to resort to comparisons, especially where a new appliance is being promoted in competition with an established product. This often seems the simplest way of explaining the qualities of a new equipment in understandable terms. Where excessive values have been accepted for an established product, correct values for a new product would not make it appear relatively attractive, which would be obviously unfair to the new product.

Buyers, of course, compare competing equipment as a basis of selection, and such comparisons may be of considerable value if thoroughly made under representative conditions. Advertisers handling products which compete from an engineering standpoint but not from a commercial standpoint, as, for example, the *mazda* and carbon lamps, often use comparison to good advantage. But generally it is inadvisable for an advertiser to use comparisons in which his product and the competing product are involved. He is presumed to be prejudiced, and even if his comparison is fair, it is liable to be discounted. The practice has therefore been generally avoided by conservative advertisers.

Ideals and Practice

In trying to express the truth conscientiously, and yet effectively, the illuminating engineering advertiser encounters many problems in which it seems necessary to compromise between an accurate scientific statement and a more popular, but less definite one. It is seldom practicable to couch an advertisement in technical terms, since it is difficult reading and may be unintelligible to average readers.

Short, simple statements which give a reasonable approximation of the truth—and are not likely to create untrue impressions—are more effective, and in the author's opinion are justifiable. When thought and ingenuity are applied, a remarkably correct description can be secured without technical terms, for even the most involved phenomena.

Another question arises where the performance of an illuminant falls below its ideal, due to practical conditions of use, such as variable voltage, low heat value of gas, imperfect maintenance or inferior accessories. Naturally, the manufacturer tests his illuminant under the best operating conditions, which may be only partially realized in practice. The conditions in one installation will be better than in another. The manufacturer is justified in assuming the best which are likely to be encountered, but if the performance is likely to be seriously poorer, fairness and usually good business would require some attention being called to it. The advertiser should bear in mind that the user will judge the product by his particular conditions of use, and may thus condemn a high grade article. It is often highly desirable to initiate educational campaigns designed to improve conditions of use.

Candlepower and Efficiency Claims

Many users, while having no scientific knowledge of candlepower, judge candlepower from previous experience with illuminants.

To many, such values are merely numbers with which they have become familiar. The street lighting business was handicapped for many years because too high a value was assigned to the open carbon arc, probably because of inaccurate means of measurement. Candlepower measurements are becoming more and more reliable with the advancement of the art, and any exaggeration is liable later to make trouble. With present facilities, such claims are inexcusable. An advertiser is certainly under obligation to know his product before advertising it.

When incandescent lamps all had similar candlepower characteristics, the horizontal candlepower, because of its ease of measurement, was the natural indication of relative light giving power. It never was suitable for comparison with other illuminants, and to-day is not suitable for comparison of different incandescent lamps. By means of reflectors, the candlepower in one direction can be greatly increased at the expense of candle-

(*Continued on page 269*)

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Obstacles that Hold Back Sales of Gas Lighting

Elsewhere in this issue we publish an abstract of the presidential address of William J. Serrill, prepared for the correspondence convention of the Illuminating Engineering Society. It is to be hoped that few gas men will fail to read it carefully.

Mr. Serrill advances few thoughts that are essentially new to the gas men affiliated with the society. But he speaks with a degree of frankness that, in the light of past utterances on this subject, is almost extraordinary. He enumerates the handicaps to gas lighting as: Lack of uniformity in the gas served; lack of uniform pressure in low-pressure systems; traces of sulphur in the gas; darkening of walls and ceilings; the problem of ignition and distance control; the policy on the part of some companies in supplying open flame burners free and charging for mantle burners; poor illuminating engineering on the part of gas-lighting salesmen; indifference on the part of gas men towards the lighting load—and the combination company.

All gas men will not agree with Mr. Serrill's contentions or the gravity thereof. He has rendered a service to the industry nevertheless, in so frankly presenting so concise an outline of the difficulties ahead as he sees them.

Advising Consumers Not to Buy Gas Heaters

That no plant can make more gas than its capacity permits is obvious. That gas companies should be advising consumers not to buy gas heaters and even prohibiting the use of gas for heating under the dire threat of cutting off all service, though for the past two years advance indications have been such that even he who ran could read, is indeed remarkable.

The coal situation has been, and is, such that the trend to gas for house-heating has gained momentum at a rate that would seem to shatter the most careful calculations. It is no exaggeration to state that the bulk of the industry has literally prayed for such a day; such an opportunity. Sooner than we had planned it literally has been hurled into our very laps, almost without effort on our part. Then some companies have awakened to actualities, and, to their amazement, have discovered that they were not prepared to welcome it, or even to provide for it.

Limited plant capacity is one reason; one, too, that would seem inexcusable. We knew it was coming. The signs were too unmistakable to be misinterpreted. We had ample time to prepare. Prices have been high, it is true. So has been labor. But the prize was of value incalculable.

Other companies will fail to reap the harvest; lay the foundations of a great heating business in the future for a reason that should bring the flush of shame to the cheek of any commercial executive. In a time of semi-demoralization in the material market, with delivery conditions uncertain to the extreme, such companies have failed to order their heaters a sufficient time in advance.

For those companies which have failed to provide for the demand that has come there is no apparent remedy. They have failed to grasp their opportunity when it practically forced itself upon them. In the future it will cost them a great deal to secure what they have

lost through lack of foresight. But there is a lesson.

A great impetus is behind the gas industry. It is not the slow-moving, easy-going, taking-things-for-granted industry that many have styled it. Alert men with as keen a commercial instinct as can be found in any industry have planned for years the concentrated, aggressive effort which we are seeing approach fruition. That some day, suddenly, an immense demand—whether there had been a war in the meantime or not—would descend upon our capacities was as certain as fate. That this demand would take form in the house-heating and industrial load, the experiences of the past two years have indicated in an equally unmistakable manner.

Take nothing for granted in the gas business. In the past decade or so it has been transformed from a relatively passive to an intensely aggressive industry. Under such conditions anything is likely to happen—even the materialization of prophesies and possibilities.

The Catalog as a Text-Book

It is stated that Henry L. Doherty, when asked where he got the rudiments of his education, invariably replies, "Out of a gas catalog." We do not vouch for the statement. We came across it in an article in the *American Magazine* for October. But it sounds plausible. Indeed if a canvass were made it is highly likely that a good proportion of our gas engineers even today would give a similar answer. Why?

We have occasion to read many books relating to the manufactured-gas industry; in fact, it would not be an exaggeration to add that we are called upon to read almost all the new works published in this country and many of those published abroad. Unfortunately the task does not make an excessive demand upon our time. We also read the gas catalogs as they come off the press.

Somehow we have gotten the impression that if we seek information on the ins and outs of anything we find it most clearly explained in the latter class of literature. As we are more or less similar in mental make-up to the general run of human beings it is quite possible that many others have gotten the same impression. There must be something in it.

One who has studied the literature of the manufacturers of the major equipment of gas making and distribution must concede that they maintain an unusually high ethical standard in the preparation of this matter. Also the tendency towards making their publicity literature educational in nature is apparent throughout.

Yet, without in any way seeking to detract from the work of the manufacturer, the AMERICAN GAS ENGINEERING JOURNAL cannot but view as an unfortunate condition this tendency, or might it not better be stated necessity, on the part of the gas industry to seek its enlightenment from literature—even though the standards maintained are of the highest—which has sprung from a desire to sell.

Why is it that in the course of a year we have so few works published on the subject of gas, and that from those few we find it so difficult to gain the enlightenment we seek?

It cannot be due to a dearth of writers capable of dealing adequately with the subjects upon which we seek information. From those we know personally we could select many eminently fitted for such tasks.

Why have not some of these men undertaken the writing of books for the enlightenment of their fellows? Are our associations demanding too much from them in the way of committee work or in the preparation of papers? Likewise, have our associations through their work so glutted the field with literature that there would be no market for such books; hence no reward to the authors or the publishers?

Either of these conditions, if investigation bore out the fact that they existed, should be remedied. No one can detract from the value of the information contained in the average hand book, committee report or convention paper. But there is a degree of stiffness and observance of formalities and conventionalities about association-issued literature that renders it unattractive and forbidding to many. Many hesitate to crack the shell, hence do not know the value of the kernel contained therein.

American Coal-Tar Dyestuffs Industries On a Solid Footing

Shortly upon the heels of the merger of the leading coal-tar chemical interests into the National Aniline & Chemical Company comes the announcement of the du Pont de Nemours Company that it will immediately launch into the coal-tar dye industry, laying the foundations for a vastly enlarged business when the cessation of hostilities permit and necessitate a let down in its explosive business. Thus we have an endorsement of the view that an American dyestuffs industry has been established by the actions of two vast corporations, headed by men who think, and think correctly, before acting.

The trend is towards making the United States, in time, self-contained; a condition, which, considering its resources, is the only logical situation that should exist. There is a splendid future ahead for this country of ours, and, as it begins to unfold, we witness the gas industry becoming an increasingly important factor in the whole scheme of affairs.

The Opportunity Within Our Hands—Will We Miss It Through Conservatism?

As this journal has pointed out many times in the past, the calls of the present-day while a misfortune to many cannot by any means be termed an unmitigated misfortune to the gas industry.

It is true that the cost of materials has gone up almost to an impossible degree, that labor is scarce, incompetent to a great degree and costly, that rates have not gone up apace, that capital, perhaps, for extensions and improvements is not easy to obtain, but, on the other hand an opportunity is offered to the gas industry to render immeasurable services to the Nation at war, to earn from it the welcome words "well done."

Things have happened in the gas industry in the past that have tended to make the public watch its every move with suspicion and distrust. For years managements actuated by sincere motives of service have expended both effort and money to remove this feeling of instinctive hostility, but it has been an uphill fight

and success seems far off. Nothing less than the spectacular can dispel these doubts suddenly.

If the gas industry at the present time puts aside all thoughts of self and makes every sacrifice in the Nation's behalf, it can be certain that the public will know of it, and when the public does know that the gas industry without any thought of its own interests put its shoulder to the wheel in such manner that the lives of thousands of Americans have been conserved on European battlefields, then we may be certain that the public will no longer cherish this senseless distrust inherited from years gone by when all American industries were run along lines we would not now call ethical.

It may require the use of tons of explosives and the useful life of a dozen heavy guns to conserve the life of one American soldier. If so the cost will be cheap. The sacrifice of money is the least sacrifice we can make to win the war.

The gas industry by putting its whole life into the task can provide the basis of unlimited quantities of explosives, can facilitate the turning out of countless pieces of heavy ordnance. It may seem that the burdens of the war fall too heavily upon one industry, but let us not think of that. Let us first do our part. We may not prosper materially, but we will at least survive. Our reward will come in the future, and it will be great.

Correspondence

Present a Favorable Time to Bring About Elimination of Unnecessary Meter Testing

SIR: The editorial in your issue of September 1, upon the deplorable inefficiency involved in the duplication of inspection of gas construction in one of the New York City boroughs, prompts me to call attention to another instance in which the State of New York, and, unfortunately, other states as well, are wasting the money of the taxpayers and the man-power of the nation. I refer to the practice of commission testing of new as well as repaired gas meters before their installation. This custom, of course, originated from the widespread, though erroneous, belief of the public that gas companies were in the habit of installing meters set to register more gas than was delivered to the consumer. The present would seem to be an appropriate time for beginning a campaign of education which would result in the elimination of this unnecessary duplication of meter-testing that is now, and always has been, correctly performed by the companies themselves.

Yours truly,

WALTON FORSTALL.

EDITOR'S NOTE: There is indeed no better time than the present to eliminate all unnecessary labor and duplicating tasks. Human effort is indeed at a premium, not only in this country, but throughout the entire civilized world. It is to be hoped that Mr. Forstall's letter will stimulate widespread discussion on the type of wasted energy that is indicated therein. The columns of the AMERICAN GAS ENGINEERING JOURNAL are open to any gas man who may wish to bring facts within his knowledge along this line to the attention of the field, or who feels that he has some suggestions of value to offer in regard to tasks that may be done away with without detriment to the industry.

Gas Man Learns at First Hand Why We Are at War

Harry L. Strange, for years manager of the Honolulu Gas Company and a member of the American Gas Institute, National Commercial Gas Association and Pacific Coast Gas Association, two years ago joined the British Army as a lieutenant in the Royal Engineers. He has since been promoted to the rank of captain. We are indebted to W. P. Hutchinson, of the Sprague Meter Company, for the following letter, written to H. R. Basford, telling of Captain Strange's experiences:

In Hospital—France.

I was glad to get your inspiring letter enclosing the President's Message. Am proud of that message and so are all of the boys in the trenches. I knew perfectly well that the dear old U. S. A. would be in this on the right side when you realized just exactly what were the real plans of this would-be "world controller," the inhuman Prussian military caste. I knew this because I have lived for many years with you all, and knew your hearts, but of course it was not to be expected that folks who had never left Europe would see it in the same light, and I have had many strenuous upholdings of America.

Thank the Lord, it is all over, and you have all seen the light. Good God, I could make your hair stand on end were I to tell you what I personally have seen of the work of this same inhuman monster, but let us forget it all and comfortably as possible settle down to wiping him off the map—absolutely nothing but that will do.

Your cheery words of approbation I have read to many of the boys, and they are glad. I tell them all you'll be mighty proud of this same U. S. A. before she gets through. The American destroyers have arrived and the advance guard of your army. France will be glad to see the Stars and Stripes, and a division of men right away; it will help their spirits and enthusiasm. They've stood a lot, you know, poor France. Your heart would bleed for France could you but see what the Boche has done to this country on his *retreat* (defeat?).

God help the German if French men and women ever get into Germany. I hope plans will be laid for the U. S. A. to send here not less than an eventual three million men. Remember the Boche has endless reserves, and has enslaved a million or so of French and Belgians to build his trenches and make his munitions, so releasing *all* his men for the army and front line work.

The U. S. A. has put her hand to the plough. I hope that no temporary setbacks or defeats will ever cause her to turn aside from her set purpose, as laid out in the President's message.

France and England have freely and gladly sacrificed their all for their ideals. I realize that America is a long, long way off, and that it will be hard for her

leaders to convince the people of the danger that threatens the world's freedom. That means their freedom, too, and I do hope and trust they will show the same spirit of self-sacrifice, and the same willingness to endure extreme hardship, semi-starvation and death wholesale, as are doing France, England and all the Allies.

Personally, I know the American people will, if they thoroughly understand what a Prussian victory would mean to the world, and to my mind a vast program of educative explanation is what is chiefly needed immediately.

Also, remember this, any peace short of the absolute, unconditional surrender of the Prussian autocracy would be a German or Prussian victory, and merely give them a breathing space to re-equip and forestall the mistakes they have made, in the next war.

And always remember that, man for man, both the French and ourselves are better fighters than he is, and we know all of his war tricks and have many ideas of our own he knows not of. Since April 9 we have given him some hard knocks, and he is pouring his reserves into this front wholesale.

I was fortunate to be awarded the Military Cross on April 9, but on May 6 I was blown up and buried by a big shell, and have been in bed since with slight concussion and a devil of a shaking up. I certainly was lucky, though we were caught in a barrage and I lost three-quarters of my company and all of my officers excepting two of us who were buried. It's all in a day's work, and we made Fritzy pay for it dearly.

I get up tomorrow and in about two weeks more I hope to be at him again and pay off a few more scores.

Sincerely your friend,

HARRY L. STRANGE.

Saving in Labor in Gas-Heated Greenhouses Goes Far to Make Up for Increased Fuel Cost

Fine Degree of Temperature Regulation Made Possible by Electrically-Operated Gas Control

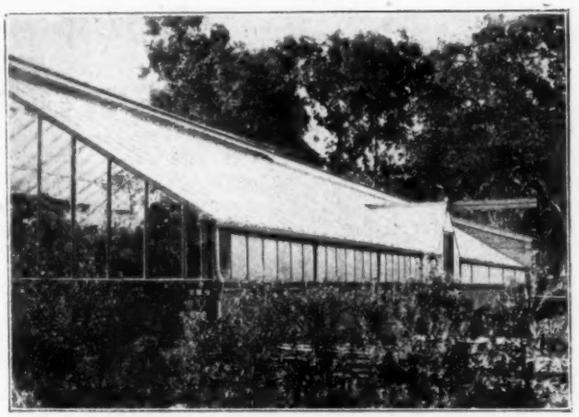
A greenhouse heated by gas is described by G. D. Mantle, of the sales department of the Pacific Gas & Electric Company in the *Pacific Service Magazine*.

The greenhouse in question is that of Andrew Welch, at Hillsborough, Cal. It contains many varieties of choice blooms, many of which are extremely susceptible to cold and require the most careful temperature regulation. The building is 79 ft. long by 24 ft. wide and contains 2,648 sq. ft. of glass surface. The hot water heating system consists of a No. 1,200 Ruud Gas House Heater connected to 1,500 ft. of 1½-in. pipe with approximately 750 sq. ft. of radiating surface.

GAS CONSUMPTION

These pipes run the length of the building beneath the flower beds and through an ornamental fish tank. The temperature is regulated almost to a degree by means of an electrically operated Minneapolis Heat Regulator, which automatically controls the supply of gas to the heater. This control is so perfect that no night attendant is necessary, and the saving thus effected makes the cost of operation little, if any, more than if any other fuel were used.

That business of this character makes a valuable addition to the revenue of the company is seen by the following statement of consumption since the connection



GREENHOUSE IN WHICH ARE GROWN MANY CHOICE BLOOMS HAS 2648 SQ. FT. OF GLASS SURFACE

of the installation: September, 1916, 24,000 cu. ft.; October, 1916, 116,000 cu. ft.; November, 1916, 155,400 cu. ft.; December, 1916, 197,800 cu. ft.; January, 1917, 171,200 cu. ft.; February, 1917, 169,600 cu. ft.; March, 1917, 140,800 cu. ft.

As the installation was made immediately upon the completion of the building, it is not possible to give exact figures as to the cost of heating with other fuels, but comparison with the cost of heating similar greenhouses with oil or solid fuel, including the wages of the necessary attendant, would go to show that, all advantages considered, the verdict must be in favor of gas.

Many Factors Should Be Taken Into Consideration in Illuminating Engineering Publicity

(*Continued from page 265*)

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The performance of illuminants has been universally indicated by initial candlepower or initial lumens. Practically no user realizes on the average so high a value. All illuminants are subject to depreciation during their operation. With some the depreciation is greater than with others. The average value would be of great benefit to the user in assisting him to make a wise selection. Unfortunately, the inherent depreciation is supplemented by an acquired depreciation which differs with the conditions of use.

Again with some illuminants the depreciation does not follow any general law, and is subject to wide variations. Some illuminants are subject to instantaneous intensity variations which are hard to evaluate. So the problem is rather a complicated one. The adoption of an equitable basis of evaluation would be of great help to the art.

In designating the lighting performance of an illuminant, the equipment should be taken into consideration. For example, it would be unfair to compare the flux of a bare incandescent lamp directly with that of

and success seems far off. Nothing less than the spectacular can dispel these doubts suddenly.

If the gas industry at the present time puts aside all thoughts of self and makes every sacrifice in the Nation's behalf, it can be certain that the public will know of it, and when the public does know that the gas industry without any thought of its own interests put its shoulder to the wheel in such manner that the lives of thousands of Americans have been conserved on European battlefields, then we may be certain that the public will no longer cherish this senseless distrust inherited from years gone by when all American industries were run along lines we would not now call ethical.

It may require the use of tons of explosives and the useful life of a dozen heavy guns to conserve the life of one American soldier. If so the cost will be cheap. The sacrifice of money is the least sacrifice we can make to win the war.

The gas industry by putting its whole life into the task can provide the basis of unlimited quantities of explosives, can facilitate the turning out of countless pieces of heavy ordnance. It may seem that the burdens of the war fall too heavily upon one industry, but let us not think of that. Let us first do our part. We may not prosper materially, but we will at least survive. Our reward will come in the future, and it will be great.

Correspondence

Present a Favorable Time to Bring About Elimination of Unnecessary Meter Testing

SIR: The editorial in your issue of September 1, upon the deplorable inefficiency involved in the duplication of inspection of gas construction in one of the New York City boroughs, prompts me to call attention to another instance in which the State of New York, and, unfortunately, other states as well, are wasting the money of the taxpayers and the man-power of the nation. I refer to the practice of commission testing of new as well as repaired gas meters before their installation. This custom, of course, originated from the widespread, though erroneous, belief of the public that gas companies were in the habit of installing meters set to register more gas than was delivered to the consumer. The present would seem to be an appropriate time for beginning a campaign of education which would result in the elimination of this unnecessary duplication of meter-testing that is now, and always has been, correctly performed by the companies themselves.

Yours truly,

WALTON FORSTALL.

EDITOR'S NOTE: There is indeed no better time than the present to eliminate all unnecessary labor and duplicating tasks. Human effort is indeed at a premium, not only in this country, but throughout the entire civilized world. It is to be hoped that Mr. Forstall's letter will stimulate widespread discussion on the type of wasted energy that is indicated therein. The columns of the AMERICAN GAS ENGINEERING JOURNAL are open to any gas man who may wish to bring facts within his knowledge along this line to the attention of the field, or who feels that he has some suggestions of value to offer in regard to tasks that may be done away with without detriment to the industry.

Gas Man Learns at First Hand Why We Are at War

Harry L. Strange, for years manager of the Honolulu Gas Company and a member of the American Gas Institute, National Commercial Gas Association and Pacific Coast Gas Association, two years ago joined the British Army as a lieutenant in the Royal Engineers. He has since been promoted to the rank of captain. We are indebted to W. P. Hutchinson, of the Sprague Meter Company, for the following letter, written to H. R. Basford, telling of Captain Strange's experiences:

In Hospital—France.

I was glad to get your inspiring letter enclosing the President's Message. Am proud of that message and so are all of the boys in the trenches. I knew perfectly well that the dear old U. S. A. would be in this on the right side when you realized just exactly what were the real plans of this would-be "world controller," the inhuman Prussian military caste. I knew this because I have lived for many years with you all, and knew your hearts, but of course it was not to be expected that folks who had never left Europe would see it in the same light, and I have had many strenuous upholdings of America.

Thank the Lord, it is all over, and you have all seen the light. Good God, I could make your hair stand on end were I to tell you what I personally have seen of the work of this same inhuman monster, but let us forget it all and comfortably as possible settle down to wiping him off the map—absolutely nothing but that will do.

Your cheery words of approbation I have read to many of the boys, and they are glad. I tell them all you'll be mighty proud of this same U. S. A. before she gets through. The American destroyers have arrived and the advance guard of your army. France will be glad to see the Stars and Stripes, and a division of men right away; it will help their spirits and enthusiasm. They've stood a lot, you know, poor France. Your heart would bleed for France could you but see what the Boche has done to this country on his *retreat* (defeat?).

God help the German if French men and women ever get into Germany. I hope plans will be laid for the U. S. A. to send here not less than an eventual three million men. Remember the Boche has endless reserves, and has enslaved a million or so of French and Belgians to build his trenches and make his munitions, so releasing *all* his men for the army and front line work.

The U. S. A. has put her hand to the plough. I hope that no temporary setbacks or defeats will ever cause her to turn aside from her set purpose, as laid out in the President's message.

France and England have freely and gladly sacrificed their all for their ideals. I realize that America is a long, long way off, and that it will be hard for her

leaders to convince the people of the danger that threatens the world's freedom. That means their freedom, too, and I do hope and trust they will show the same spirit of self-sacrifice, and the same willingness to endure extreme hardship, semi-starvation and death wholesale, as are doing France, England and all the Allies.

Personally, I know the American people will, if they thoroughly understand what a Prussian victory would mean to the world, and to my mind a vast program of educative explanation is what is chiefly needed immediately.

Also, remember this, any peace short of the absolute, unconditional surrender of the Prussian autocracy would be a German or Prussian victory, and merely give them a breathing space to re-equip and forestall the mistakes they have made, in the next war.

And always remember that, man for man, both the French and ourselves are better fighters than he is, and we know all of his war tricks and have many ideas of our own he knows not of. Since April 9 we have given him some hard knocks, and he is pouring his reserves into this front wholesale.

I was fortunate to be awarded the Military Cross on April 9, but on May 6 I was blown up and buried by a big shell, and have been in bed since with slight concussion and a devil of a shaking up. I certainly was lucky, though we were caught in a barrage and I lost three-quarters of my company and all of my officers excepting two of us who were buried. It's all in a day's work, and we made Fritzy pay for it dearly.

I get up tomorrow and in about two weeks more I hope to be at him again and pay off a few more scores.

Sincerely your friend,

HARRY L. STRANGE.

Saving in Labor in Gas-Heated Greenhouses Goes Far to Make Up for Increased Fuel Cost

Fine Degree of Temperature Regulation Made Possible by Electrically-Operated Gas Control

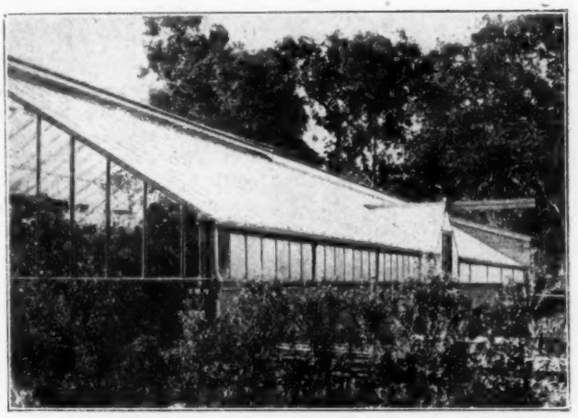
A greenhouse heated by gas is described by G. D. Mantle, of the sales department of the Pacific Gas & Electric Company in the *Pacific Service Magazine*.

The greenhouse in question is that of Andrew Welch, at Hillsborough, Cal. It contains many varieties of choice blooms, many of which are extremely susceptible to cold and require the most careful temperature regulation. The building is 79 ft. long by 24 ft. wide and contains 2,648 sq. ft. of glass surface. The hot water heating system consists of a No. 1,200 Ruud Gas House Heater connected to 1,500 ft. of 1½-in. pipe with approximately 750 sq. ft. of radiating surface.

GAS CONSUMPTION

These pipes run the length of the building beneath the flower beds and through an ornamental fish tank. The temperature is regulated almost to a degree by means of an electrically operated Minneapolis Heat Regulator, which automatically controls the supply of gas to the heater. This control is so perfect that no night attendant is necessary, and the saving thus effected makes the cost of operation little, if any, more than if any other fuel were used.

That business of this character makes a valuable addition to the revenue of the company is seen by the following statement of consumption since the connection



GREENHOUSE IN WHICH ARE GROWN MANY CHOICE BLOOMS HAS 2648 SQ. FT. OF GLASS SURFACE

of the installation: September, 1916, 24,000 cu. ft.; October, 1916, 116,000 cu. ft.; November, 1916, 155,400 cu. ft.; December, 1916, 197,800 cu. ft.; January, 1917, 171,200 cu. ft.; February, 1917, 169,600 cu. ft.; March, 1917, 140,800 cu. ft.

As the installation was made immediately upon the completion of the building, it is not possible to give exact figures as to the cost of heating with other fuels, but comparison with the cost of heating similar greenhouses with oil or solid fuel, including the wages of the necessary attendant, would go to show that, all advantages considered, the verdict must be in favor of gas.

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(*Continued from page 265*)

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Again with some illuminants the depreciation does not follow any general law, and is subject to wide variations. Some illuminants are subject to instantaneous intensity variations which are hard to evaluate. So the problem is rather a complicated one. The adoption of an equitable basis of evaluation would be of great help to the art.

In designating the lighting performance of an illuminant, the equipment should be taken into consideration. For example, it would be unfair to compare the flux of a bare incandescent lamp directly with that of

another illuminant equipped for some particular class of service.

Efficiency taken alone is not a fair basis for lamp selection, unless all other conditions are the same. Any economic comparison should include all other factors, such as maintenance and investment costs, and should then be considered in connection with other elements, such as suitability, efficiency of application, diffusion, reliability, etc. While these items may not seem to bear directly on advertising, they should be taken into consideration in writing such claims.

In the early days of tungsten filament lamps, efficiency was the big talking point, and was so strongly emphasized that there was a tendency among users to overlook the advantages of diffusion and similar essentials of good lighting. This emphasizes the desirability of advertising good practice, as well as important merits of apparatus.

Glare

The ill effects of glare are well known, as well as the necessity of equipping all modern light sources with suitable diffusing devices. It does not follow, however, that the other extreme is desirable; it is often regarded as very undesirable.

Some manufacturers of diffusing equipment seem prone to emphasize this extreme, and in their advertising, credit their particular appartus with a monopoly of the virtues in overcoming a terrible glare supposed to dominate all other equipments.

At the present time one of the real needs of illuminating engineering is some type of glare-meter which will enable us to analyze and determine the degrees of diffusion desirable for different lighting problems, and express the value of different equipments in recognizable terms.

Color

Probably no other class of illuminating engineering claims have been subject to so much abuse as those of white or daylight color illumination. Some discrepancy may have been more or less excusable several years ago, before data on the composition of light was generally available. With present data and testing facilities, sweeping, extravagant claims, some of which are still appearing, are not justifiable.

Some advertisers have been recommending their devices for all sorts of unsuitable applications. It is perhaps fortunate that they have been mistaken in the desirability of daylight color, as well as in the performance of their product, so that the result is not so bad as it might have been. Many buyers, however, who actually need a reasonably close approximation of daylight illumination for color matching purposes, have learned that such advertising cannot be relied upon.

Those who have studied the color matching problem, recognize several degrees of accuracy compromised with efficiency for different applications. One of the difficulties of advertising equipment of only approximate accuracy is that it is so much easier to claim perfect color than to explain that the approximation meets the practical requirements.

Illumination Photographs

When properly applied, photographs of lighting effects are legitimate and effective means of exploiting lighting equipments.

A number of large advertisers have been using this method honestly and with very considerable success. Unfortunately, such photographs do present considerable opportunity for deception, both intentional and unintentional.

Considerable skill, differing from that exercised in ordinary photography is required to make photographs represent lighting effects as viewed by the eyes of an observer. A commercial photographer, unless otherwise instructed, is likely to employ all the arts of his profession, including flashlights, shading, and the retouching of negatives, to produce the most attractive pictures. And the engraver will apply further arts of the retouching order in making cuts.

Thus, with the best of intentions, an advertiser may occasionally find himself sending out deceptive illustrations, unless extreme care is exercised.

Those who have made the most conservative use of illumination photographs have considered retouching inadvisable. The retoucher seldom sees the actual installation; therefore, is likely to work for artistic effects rather than true productions.

Since the brightness of a photograph is fully as much a function of the time of exposure and allied factors as it is of the intensity of illumination, one cannot ordinarily judge intensity from a photograph. On the other hand, shadows or their absence will be portrayed in a properly taken photograph.

Photographs have sometimes been used to compare competing illuminants whose rays have different actinic values. This, of course, is unfair. Every effort should be made to reproduce lighting effects truthfully, let this very useful means of publicity become discredited and thus rendered ineffective.

Conclusion

In discussing the various topics an effort has been made to adhere to generalization. The aim of this paper has been to suggest principles, and not in any case to direct criticism at any individual advertiser. While believing in the constructive, rather than destructive treatment of illuminating engineering subjects, the author has felt the necessity of devoting a considerable part of the paper to criticism of present shortcomings.

Chicago Company Makes Use of Moving Pictures to Sell Washing Machines

The Peoples Gas Light & Coke Company of Chicago is utilizing the " movies " to sell a new gas heated electric washer that has just been put on the market. The machine boils and washes clothes at the same time. In order to demonstrate the appliance before the greatest number of possible buyers in the shortest possible time the company had a one-reel film made showing the " emancipated housewife " operating the machine. The picture is being shown in three moving picture theatres each week and it will be continued until it has visited every section of the city.

Regenerator Stove for Coke Ovens Made of Trapezoidal Bricks

Patent No. 1,227,820; described in Patent Office *Gazette*, May 29, 1917, page 1423. Alfred C. Nelson, Lakewood, Ohio. Filed Nov. 18, 1915. Serial No. 62,151. (Cl. 72-15.5.)

This regenerator stove consists of a checker work flue structure made of brick of trapezoidal cross section and built in layers.

News of the Gas Industry

Girl Meter Reader as Substitute for Drafted Men —First in Hampshire County, Mass.

Owing to the fact that several young men employed by the Easthampton (Mass.) Gas Company have been drafted the company has hired Miss Anna Clair to read meters. She will go from house to house, will enter cellars, read the meters and leave bills. The experiment has been tried in other places with satisfaction, but it is the first time in Hampshire County, Mass.

Electric and Gas Association Meets at Boston

The twenty-eighth annual meeting of the Massachusetts Electric & Gas Association was held at Boston, Sept. 14. President Charles L. Edgar was chairman.

Reports of the executive committee and the treasurer were heard and accepted. A balance of about $7,000 is in the treasury.

New officers elected for the ensuing year included Arthur E. Childs of the Clinton Gas Light Company; Micajah P. Clough, Lynn Gas & Electric Company; Frederick S. Pratt, Fall River Gas Works Company; Oliver Prescott, New Bedford Gas & Edison Light Company, and Bowen Tufts of the Parker utilities.

The above were chosen members of the executive committee. The secretary and counsel of the association is Everett W. Burdett. The usual banquet was omitted.

Denver Company Passes 5,000,000 Mark in Daily Gas Output

The gas production of the Denver Gas & Electric Light Company, one of the subsidiaries of Cities Service Company, recently reached the highest figure which it has ever attained, namely, 5,064,900 cu. ft. in a single day. This figure typifies the growth of the artificial gas business of the Cities Service properties, inasmuch as the passing of the 5,000,000 mark means that the Denver company has increased its output per day from 750,000 cu. ft. in 1902 to the present figure—a gain of about 700 per cent.

Worcester Gas Light Company Holds 69th Annual Meeting—Reports 1,055,-061,000 Cu. Ft. Sold During Year

Worcester Gas Light Company in its last fiscal year, exceeded the business of any previous year, it was announced after the close of the sixty-ninth annual meeting held recently in the rooms at 240 Main Street. The question of a successor to President Dana D. Barnum was taken up by the board of directors and a committee appointed to take the matter into consideration and report at a future meeting of the board.

During the year closed the company sold 1,055,061,000 cu. ft. of gas. This was a gain 8.97 per cent over any previous year and marked the greatest amount of business ever done by the company. The sales of major appliances during the year were 1,877 and since 1909, show an increase as follows: 1909, 474; 1910, 543; 1911, 517; 1912, 1,081; 1913, 1,494; 1914, 1,451; 1915, 1,620; 1916, 877.

The increase in the number of new consumers was 910 and for the period from 1909 to 1917, there has been a steady increase amounting to 82 per cent in eight years.

During the fiscal year the company used 50,082 tons of coal and 1,844,378 gal. of oil. There were sold 11,326 tons of coke. The expansion work consisted of the laying of 25,087 ft. of cast iron main pipe, which represented a large number of new customers in the city.

The assets of the company for the year ending June 30, 1917, were $4,198,137.81. During the year the company has completed its coal gas plant, which doubles the capacity output of coal gas. This addition to the plant cost approximately $1,000,-000 and was three years in building.

At the meeting of the stockholders the following directors were elected: A. G. Bullock, F. H. Dewey, Dr. S. B. Woodward, George Crompton, D. D. Barnum and DeWitt Clinton. Mr. Clinton was elected treasurer and clerk of the corporation. After the meeting of the stockholders the directors organized as follows: President, Dana D. Barnum; vice-president and general counsel, F. H. Dewey.

Kentucky Company Withdraws Request to Mix Gas

The Louisville (Ky.) Gas & Electric Company has sent a letter to the city officials withdrawing the request of thirty days previous that it be permitted to furnish a certain amount of artificial gas at increased prices in addition to the natural gas provided for by contract.

In its letter to the city officers the company states that it will furnish natural gas as required by franchise and will make every effort to keep the city properly supplied during the coming winter.

Mahanoy City Gas Company Continues Till October 1

Manager J. V. Cattron, of the Mahanoy City (Pa.) Gas Company, has been instructed to continue operation of his plant until October 1. The firm had planned to suspend September 15 because of lack of support.

Increased Rate Asked by West Virginia Company

The Raccon Gas Company, operating at Salem, Harrison County, W. Va., has filed an application with the Public Service Commission for permission to increase its rates. The company asks that it be permitted to increase its domestic rates from 17 cents to 22 cents a thousand cubic feet, rates to religious and educational institutions from 12 to 17 cents, and its manufacturing rates from 4 cents and 5 cents on old contracts and 15 cents and 10 cents on new contracts to 13 cents for all gas used for manufacturing purposes.

Medina, N. Y., Plant Will Again Operate

Medina, N. Y., is to have manufactured gas again at an advance in price of 25 per cent. The gas company, which closed about a month ago because it could not pay expenses, has been taken over by M. A. Bowen, John T. Miller and Irving G. Rowley. Superintendent Collins will be retained to operate the plant.

Request for San Jose, Cal., Rate Increase

The Pacific Gas & Electric Company has filed with the Railroad Commission an application to raise its rates for gas in San Jose, Cal., by reducing the heating value of the gas from 600 British thermal units to 550 units, and advancing the charges to the following schedule:

$0.75 for 600 cu. ft. or less sold to one consumer during any month.

$1.20 per 1,000 cu. ft. for the next 4,400 cu. ft.

$1.00 per 1,000 cu. ft. for the next 5,000 cu. ft.

$0.90 per 1,000 cu. ft. for the next 10,000 cu. ft.

$0.75 per 1,000 cu. ft. for all over 20,000 cu. ft.

This rate applies in the city of San Jose and adjacent suburbs.

Artificial oil gas of an average heating value of 550 B.t.u. per cubic foot shall be furnished in accordance with the rules and regulations on file with the Railroad Commission.

The Pacific Gas & Electric Company says it is losing money at the present gas rates in San Jose, largely on account of the advance of the price of oil from 87 cents a barrel to $1.50 a barrel, and the increased cost of labor and materials. The company says that its net income for the year beginning Sept. 1, 1917, at the present rates, will not exceed 2.17 per cent on the actual physical value of its property used.

In its decision upon these rates, the commission found the value of the physical property of the company used in San Jose, together with that added since, at $953,650. Upon this valuation, the application says, the interest will be but 2.17 per cent for the next year. The company's entire revenue for the year ending Sept, 1, 1918, at the present rates will not exceed $262,599, and its expenses will be $207,603, leaving a net income of $21,116.

The company says that the average price of oil delivered at San Jose for the year ending June 30 last was $1.088 a barrel, but that it is now paying $1.50.

Port Huron Commission Has Not Authority to Grant Increase

The City Commission has decided that it has no authority to grant the request of Port Huron (Mich.) Gas & Electric Company to increase gas rate from 80 cents to $1 a thousand cubic feet.

Fixture Maintenance the Requisite to Holding Interior Lighting Business

That the only way a gas company can hold its own against the competion of electricity for the lighting of stores and other business premises is by means of a system whereby the owner is relieved of the care of his lamps, i.e., a maintenance system, is the belief of Everett F. Gray, treasurer of the Lowell (Mass.) Gas Light Company and of the members of the sales and appliance department staffs.

The Lowell company is conspicuous for the large percentage of store and commercial lighting it has in that city, about 90 per cent of the business houses being illuminated by gas. This despite the fact that electricity is only 10 cents net to the smallest consumers, this rate having been reached by two reductions in the past year or two.

The gas-lighted customers of the Lowell utility do not seem inclined to substitute electric for gas lighting, and the reason for this appears to lie in the gas company's thorough system of maintaining fixtures.

Mr. Nash, of the appliance department, pointed out that where fixtures are left to individual care, neglect is apt to creep in; or else the bother of cleaning and renewing the mantles becomes irksome; especially so if the electric company's salesman dilates on this phase of the subject. With the Lowell maintenance policy in operation, there is no opportunity for invidious comparison. The company's men—of whom there are seven regularly employed on this service—make monthly calls and put the fixtures in condition for the most efficient illumination. No charge is made for the labor, but mantles and other materials are charged for at the usual prices representing a profit.

Under the company's fixture rental system, Humphrey arcs are rented for $2 per year, inverted 3-burner lamps for $3 per year, and outside arcs at corresponding rates. Reflectoliers are rented as follows: Two-light, $3; 3-light, $3.50; 4-light, $4 per annum. Single mantle Reflex lights are rented to mills in large numbers, anti-vibrators being installed where there is machinery that would cause flickering. The gas company furnished drops and lamps, installing the same from existing piping at no expense to the consumer. For these lights the rental and maintenance charge is, for less than twelve 15 cents per month per lamp; for twelve or over, 10 cents each per month. The rental charge is billed in advance for a whole year.

A list of all vacant stores in the territory is kept at the office, and changes in occupants are followed up assiduously. If a tenant having rented fixtures leaves a store, the apparatus is left installed in readiness for the new tenant, who almost invariably utilizes the fixtures, paying the rental-maintenance charge rather than having new fixtures, either gas or electric, installed.

Domestic business is attended to and followed up in the same systematic manner. A force of about five men call at all the houses of customers, carrying mantles and a line of flatirons. There is no rental of fixtures for homes, but the personal touch of the company's force tends to stimulate the domestic uses of gas and conserve the employment of gas as an illuminant. The work is supervised by a chief, who is supplied with an automobile, the more readily to cover the whole territory.

It is found, by a series of tests, that comparing 85-cent gas with electricity at 8 cents a kilowatt hour —the latter being the rate to large consumers—the cost of gas lighting to the customer represents a saving over electricity of about 40 per cent, while with the maintenance charge added, the saving is about 33 per cent over electric lighting.

In addition to its successful commercial and home lighting achievements, the Lowell company is able not only to hold but also to increase slightly its street lighting business.

Just at present the company is changing its appliance store from its location on Merrimac Street, near Shattuck, to Merrimac and John Streets, nearer the heart of the business center of Lowell. The new store will have a complete line of ordinary and cabinet ranges, fireless cookers, water heaters, gas steam radiators and fixtures of all types. The business with bakeries, restaurants and hotels is large and increasing.

On Sept. 1 the maximum net rate for gas is to be increased from 85 cents to 95 cents per 1,000 cu. ft.

PAINESVILLE, O., Council refused to grant the Painesville Gas Company a 25 per cent raise over the franchise price of $1 a 1000 cubic feet.

Rate Increase Asked for Several Ohio Cities

The River Gas Company, which furnishes the city of Marietta, Belpre, New Matamoras, Chesterhill, Stockport, Fly, Reno, and Newport, O., with natural gas, has made application to the Public Service Commission of Ohio for permission to increase its rate from 22 cents per thousand to 27 cents, with the usual discount, the new rate to take effect Oct. 1, 1917.

Brockton, Mass., Company Increases Wages

Wage increases, ranging from 10 to 30 per cent weekly, have been granted 34 employees of the Brockton Gas Light Company by General Manager George H. Priest, after several conferences with Terrence P. McSweeney, business agent of the Treers union, and William Johnston, president of the Stationary Firemen's union, both representing the men.

The increases affects water gas operatives, fire cleaners and coal gas operators, firemen, coal gas makers, water gas helpers, night watchman, conveyor men, coal passers, and a purifying house man.

The employees asked eight hours a day, one day off in seven, time and a half for overtime, and double time for Sunday work; if Sunday is the day off, two weeks vacation with pay each year.

In reply to the requests of the men, Mr. Priest stated conditions are abnormal during war times and there is a demand for more labor rather than less. He said a seven-day week as at present would be better, but is willing to grant a six-day week when the war is over and labor conditions become settled.

A schedule drawn up by Mr. Priest increasing the wages of the 34 employees, giving them the same increase as on a six-day basis, but which gives the men the benefit of a larger weekly income on a seven-day basis, was accepted by Mr. McSweeney as the representative of the employees.

The new schedule became effective Aug. 24. The old and new wages are as follows:

Water gas operators, increased from $21 to $24.50 and from $19.25 to $24.50; coal gas operators and fire cleaners, from $19.25 to $24.50; boiler firemen, from $19.25 to $22.75; coal gas makers, from $21 to $24.50 and from $19.25 to $24.50; water gas helpers, from $16.80 to $21; fire cleaners, from $17.50 to $21 and from $18.20 to $21; watchmen, from $16.80 to $19.25 and from $17.50 to $19.25; conveyor men, from $17.50 to $22.75; yard men, from $14.50 to $16.50, $16.80 to $19.25 and $15 to $16.50; coal passers, from $17.50 to $21; purifier foreman, from $15 to $18.

Coal gas makers will receive $3.50 a day after six months' experience in the retort house. Boiler firemen will have vacations the same as engineers and the purifying man will receive $3 a day until he is incapacitated for work or retires. He will have one week a year vacation and no overtime work.

N. C. G. A. Window Display Service Discusses Value of Windows With and Without Background

The always-interesting folder distributed by the National Commercial Gas Association on window displays contains a worthy discussion, in its September number, on gas windows with or without backgrounds.

This talk is direct and readily understood; some of the more important points brought out are as follows:

"The window which gives a view into the store was in time past advocated by many a good manager, but modern publicity methods have more and more disproved of it. * * *

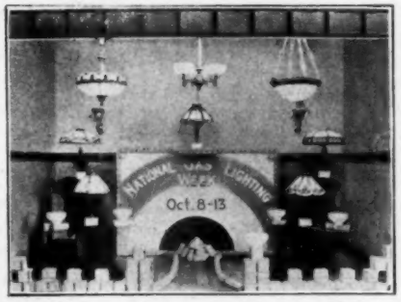

FIG. 1. DISPLAY DESIGNED FOR NATIONAL GAS LIGHTING WEEK

A display window is meant to attract attention to a line of goods —not to light the interior of the store, nor yet to permit all the merchandise in it to be seen. As a prospective customer passes your store, he is bound to be much more interested in the persons moving about inside than in the inanimate objects directly before his eyes. A display window without a background would be as distracting as a stage without a backdrop, to shut out the activities and the scaffolding behind the scenes. Concentration of attention on the display is only possible when the passerby cannot see into the store; hence a low background is almost as bad as none at all."

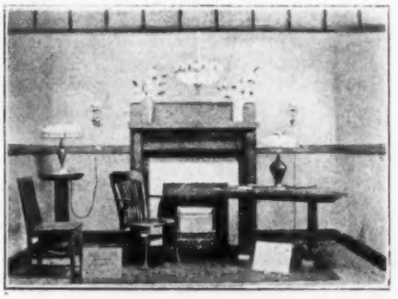

FIG. 2. LIGHTING DISPLAY GIVING AN ARTISTIC EFFECT

Two of the suggested displays are shown in the accompanying photographs—Fig. 1 is an idea for National Gas Lighting Week, while Fig. 2 is a timely display for gas lighting with a gas fireplace in the background. Due to limited space, the description of only these two windows are given, as follows:

No. 1. National Gas Lighting Week.—Prepare a beaver board panel of appropriate size (from one-third to one-half the length of your window). Paint with water color the semi-circles of red, white and blue. Use white and black or blue letters for the inscription. Form a frame for the board by gluing or securing with fasteners empty mantle boxes around its edge. Lamp boxes form the "fence" and outline the "roadway" up to the semi-circle. Four pedestals permit the display of various types of reading lamps. Drape these with velour or use good-looking mahogany supports with glass shelves. Note the wall connections on the border which runs around the window. Special cards to state local offerings and prices may be used.

No. 2. Lighting Display.—Produce the effect of a cozy room by placing table, chairs, taberet and rug as indicated. In the mantle against the background put a modern gas fireplace heater—lighted, if possible. Five lamps are on display here—each one should be of the most handsome and modern design. Note the wall connections. Two cards on lighting and one on gas heating should be used. This window may be installed during or just before Gas Lighting Week.

Many Employees of Chicago Company Now in National Service

The current issue of the *Advance Club News*, published by the employees of the Peoples Gas Light & Coke Company of Chicago, published the following Roll of Honor of the men from the company who have enlisted:

Edw. E. Bailey, Officers' Training Camp.
Geo. N. Barker, Marines.
Dan Brindisi, Ill. Nat. Guard.
L. L. Bronnell, Ill. Nat. Guard
Harry Calfu, Artillery.
William Cairns, Army.
John J. Campbell, Artillery.
W. H. Caspar, U. S. Army.
C. J. Cawley, Navy.
Roy C. Chase, Navy.
H. Cordit, Ill. Nat. Guard.
Richard Cull, Artillery.
Leon Cussen, Army.
R. C. Dunning, Ill. Nat. Guard.
R. E. Dorman, Ill. Nat. Guard.
Carl B. Evans, Ill. Nat. Guard.
Frank Fairfield, Ill. Nat. Guard.
Ed. J. Farrell, Ill. Nat. Guard.
Arthur Faul, Navy.
C. Finn, Ill. Nat. Guard.
Frank Joseph Farton, Navy.
Joseph Fredona, Ill. Nat Guard.
Frank Furlong, Officers' Train. Camp.
William Fyffe, Ill. Nat. Guard.
Joseph W. Galifski, Army.
John F. Garvin, Ill. Nat. Guard.
Jas. J. Glashino, Engineers' Corp.
Jos. Gleich, Navy.
Thos. Goulden, Artillery.
W. R. Green, Navy.
Alex E. Guenette, U. S. Army.
Lewis C. Greuling, Wireless Operator.
J. L. Hangel, Navy.
Wm. J. Hayden, Eighth Infantry.
John Hurt, Navy.
E. M. Heiser, Ill. Nat. Guard.
A. O. Herout, Ill. Nat. Guard.
R. C. Hoag, Army.
Louis Chas. Holmes, Infantry.
L. Huntinghouse, Navy.
Fred Husser, Navy.
Olaf Howson, Army.
W. H. Janus, Navy.
Victor Quering, Navy.
W. L. Richmond, Artillery, I. N. G.
Frank A. Rossner, Artillery, I. N. G.
John Rump, Navy.
Ernest G. Ryberg, Red Cross.
Daniel Salmon, Ill. Nat. Guard
Gustave Schone, Ill. Nat. Guard.
Geo. T. Scott, Artillery.
Richard A. Searls, Cavalry.
W. J. Seaton, Ill. Nat. Guard.
Lewis Sham, Navy.
C. C. Shaw, Ill. Nat. Guard.
C. A. Sherwood, Ill. Nat. Guard.
Walter Stern, Infantry.
Edw. J. Sullivan, Artillery.
R. Johnson, Marines.
Clarence O. Johnson, Navy.
Enid Jargensohn, Officers' Reserve.
C. S. Joblawski, Artillery.
E. M. Jones, Navy.
R. C. Jorgenson, Navy.
Joseph E. Kennedy, Navy.
Joseph R. Kirk, Infantry.
E. P. Knight, Canadian.
C. Kasfeerd, Ill. Nat. Guard.
R. A. Kempski, Ill. Nat. Guard.
Louis E. Kulp, Artillery
Peter Lang, Artillery
Geo. Lathrop, Cavalry.
N. H. Lehman, Ill. Nat. Guard.
Ed. Linde, Coast Guard.
F. P. Linster, Artillery.
Stephen R. Longhman, Ill. Art.
David Love, Artillery.
Stephen J. Madison, Ill. Art.
Roy C. Marsh, U. S. Infantry.
Ett. Mamion, U. S. Infantry.
Wm. Mahoney, Army.
M. A. Marville, Ill. Nat. Guard.
D. J. Murphy, Army.
Ed. Mannheim, Army.
Bryan McNamarck, Army.
John Malloy, Medical Corps.
Chester Monroe, Ill. Nat. Guard.
Jos. F. Mulligan, Ill. Nat. Guard.
Dr. Geo. K. Musselman, Medical Res.
W. C. Norton, Ill. Nat. Guard.
Jas. M. Neill, Ill. Nat. Guard.
J. B. Nelson, Navy.
Dr. Homer K. Nicoll, Med. Officer.
Frank Nogar, Army.
F. W. Officer, Army.
F. J. O'Connell, Artillery.
Allen L. Ogden, Ill. Nat. Guard.
Frank Patch, Army.
R. S. Peterson, Ill. Nat. Guard.
Dr. W. E. Post, Gov. Service.
Elie Quintel, Engineers.
Carl H. Swedner, Red Cross.
J. G. Tatzreiter, Ill. Nat. Guard.
Ed. Thomas, Army.
Timothy Tierney, Army.
Wiel Toner, W. I. Infantry
O. Tyrott, Navy.
Wm. Uhlhern, Hospital Corps.
Geo. M. Vivian, Engineers.
Adolph Waonauskis, Army.
W. F. Wimble, Ill. Nat. Guard.
W. F. Wittmeyer, Artillery.
W. H. Woldman, Cavalry.
Wm. P. Wunn, Ill. Nat. Guard.
W. Ziontarski, Ill. Nat. Guard.

11TH INF. ILL. NAT'L GUARD

Anderson, J. E.
Beck, J.
Brockhouse, A.
Brown, H. H.
Burns, Walter.
Cameron, R. A.
Christel, J.
Creighton, R.
Froom, W. E.
Gustafson, C. E.
Hall, C. E.
Hill, C.
Hill, Dan A.
Jorgenson, J. D.
Kelley, Jno.
Kirchway, C. H.
Kiley, E.
Nevine, H. C.
Nicolls, A.
O'Neill, J. J.
Stapleton, F. J.
Stewart, T. M.
Stock, Conrad
Vlazney, Jos.
Velkstorp, J. F.
Wandas, H. O.
Ward, S. H.

Honor Roll of Pacific Company

The *Pacific Service Magazine* has published in its recent number a Roll of Honor of those employees of the Pacific Gas & Electric Company who have enlisted in the service of the United States. This list is in addition to those printed in the Pacific magazine in May and June and is well worthy of reprint:

Name	*Occupation*	*Department or District Where Employed*	*Character of Service for United States*
Comer A. Altland	Clerk	S. F. District	Reserve Signal Corps
Clyde A. Bigger	Statem't Taker & Coll'r.	San Jose District	U. S. Navy
Jos. Osborne Butler	Operator	Napa District	Signal Corps
J. D. Butler, Jr.	Secretary's Office	San Francisco	Cal. Field Artillery
Eugene H. Charles	Oiler	San Jose District	U. S. Navy
Leon de Fremery	Attorney	Rate Dept.	Aviation Corps
Frank Taylor Gash	Operator	Napa District	Officers' Reserve Corps
Lester G. Glasson	Brushtender	S. F. District	Signal Corps
Ernest Hildebrand	Oiler	S. F. District	Motor B't Patrol Serv.
John Charles Hornbeck	Motorman	Sacramento Dist.	Cal. Cavalry
C. L. Hornberger	Secretary's Office	San Francisco	Cal. Field Artillery
Ray L. Hull	Operator	S. F. District	Signal Corps
Dwight William Jones	Asst. Supt. Gas Dept.	S. F. District	Cal. Field Artillery
Donald S. Kennedy	Oiler	S. F. District	Naval Reserve
Wm. P. Kiely, Jr	Stenographer	San Jose District	Naval Reserve
Burton E. Laughlin	Clerk	Redwood District	Cal. Coast Art'y N. G.
Owan L. MacGregor	Stenographer	San Jose District	U. S. Navy
Wm. Thompson Martin	Forem'n Undergr'd Sys.	S. F. District	U. S. Navy
Lloyd M. Morrill	Clerk	Alameda Co. Dist.	Field Artillery
Ira John Mullen	Auto Mechanic	Sacramento Dist.	Engineer Corps of Cal.
Elmo Neil Murphy	Land Dept.	San Francisco	Engineer Res. Corps
Alex. Pringle	Cable Splicer	S. F. District	U. S. Signal Corps
Cornelius Thomas Shea	Collector	S. F. District	Naval Reserve
Peter Burnett Sheehan	Collector	S. F. District	Med. Corps U. S. Army
Joseph M. Simon	Meter Repairer	S. F. District	Cal. Coast Art'y N. G.
Robert Fred Smith, Jr.	Clerk	Redwood District.	5th Reg't U. S. Army
Geo. Strofeld	Laborer	Redwood District.	U. S. Navy
Grover Smith Tracy	Clerk	S. F. District	Cal. Field Artillery
Leslie E. Wolbert	Electrician	Redwood District.	Masonic Ambulance Corps

Rate Reduction at Missoula, Mont.

Announcement of a new schedule of gas rates which will materially lower the price of gas in Missoula has been made by George P. Smith, president of the Missoula Gas Company. The new rates will go into effect immediately.

The new schedule set a minimum of 60 cents on the first 300 cubic feet or less used, with a 10 cent discount for cash. For the first 3,000 cubic feet a rate of $1.85 has been established per 1,000 cubic feet with a discount privilege.

Mr. Smith said recently that the lowering of the gas price had been decided by the company and was unsolicited by the patrons of the company.

The schedule for the new rates follows:

For 300 cubic feet or less per month	$0.60
First 3,000 cubic feet, per 1,000 cubic feet	1.85
Next 5,000 cubic feet, per 1,000 cubic feet	1.60
Second 5,000 cubic feet, per 1,000 cubic feet	1.50
Third 5,000 cubic feet, per 1,000 cubic feet	1.40
Fourth 5,000 cubic feet, per 1,000 cubic feet	1.30
Fifth 5,000 cubic feet, per 1,000 cubic feet	1.20
Sixth 5,000 cubic feet, per 1,000 cubic feet	1.10
All above 35,000 cubic feet, per 1,000 cubic feet	1.00

The discount for cash payments is allowed on all rates.

Boston Annual Report Shows Good Increase

The annual report of the Boston Consolidated Gas Company for the year ended June 30, presents figures of output in cubic feet, together with a statement of the plant account, which compare as follows:

	1916-17.	1915-16.
Largest daily output	21,332,000	19,709,000
Smallest daily output	9,028,000	8,681,000
Sold other cos.	1,243,473,800	1,047,814,856
Receipts from sales	$560,351	$462,854

The largest sales were made to the Newton and Watertown Gas Light Company, which amounted to 691,358,000 cu. ft. for $311,111, compared with 609,196,700 cu. ft. sold in the previous year for $269,688.

The plant account increased from $164,252 to $26,534,539, the changes being as follows:

	Plant account June 30, '16.	Plant account June 30, '17.
Land and buildings.	$5,777,369	5,772,051
Machinery & appls.	6,968,428	7,011,511
Mains	10,242,306	10,280,726
Mains and serv bets	127,782	135,639
Services	1,572,908	1,605,655
Meters	1,681,495	1,728,956
Totals	26,370,287	26,534,539

Five More Byllesby Employees to Serve Government

Since publication of the list of Byllesby employees in the Chicago office who are in the Government service, the following have joined the colors:

Name.	Service Rank.	Dept. of Service.
S. B. Flynn	Boats'n Mate	Navy
O. F. Flynn	Seaman	Navy
C. C. Levis		Officers' Reserve
A. S. Cummins		Officers' Reserve
Albert Palm		Illinois Nat. Guard

Bituminous Coal Report to August 15

The following statement of carloads of bituminous coal that originated on 90 railroads and of beehive coke on 18 railroads in July, 1917, is compiled from reports received by the Geological Survey, Department of the Interior, by noon, August 15, 1917:

There was a decrease in the shipments of bituminous coal on these roads in July, 1917, compared with June, 1917, of 16,569 cars, or 2.1 per cent, but an increase compared with July, 1916, of 129,721 cars, or 20.4 per cent. There were, however, but 25 working days in July, 1917, and 26 working days in June, 1917. The average loading in July was 30,599 cars, compared with 30,059 in June. The increase in average daily loading, which is the true index of the rate of production, was 540 cars, or 1.8 per cent, in July, 1917, over June, 1917. The number of working days in July, 1916, was the same as in July, 1917, and the total cars loaded in these months therefore gives a direct comparison. There was an increase in the average daily loading in all districts shown east of the Mississippi and an actual increase in the number of cars loaded in July, 1917, compared with June, 1917, in the low-volatile coal fields of Pennsylvania, Maryland, and West Virginia, and in eastern Kentucky and the high-volatile coal fields of West Virginia. The most notable increase in the total shipments in July, 1917, compared with July, 1916, was from Illinois, Indiana, and western Kentucky. It amounted to 84 per cent. The 90 roads whose figures are included in this statement originated 90.6 per cent of the total railroad shipments of bituminous coal loaded at the mines in 1916, or 75 per cent of the total production. The combined figures of bituminous coal and beehive coke loaded on the roads included in this statement represent 85 per cent of the total bituminous coal mined in 1916. Daily reports received by the Geological Survey in June and July from roads originating more than 50 per cent of the bituminous coal loaded show that the maximum rate of production was reached in the first half of July and has been declining since that time.

The shipments of beehive coke in July, 1917, increased 0.4 per cent over June, 1917, and 11.5 per cent over July, 1916.

Personal Notes

SLOAN, HUDDLE, FEUSTEL and FREEMAN, consulting engineers of Chicago and Boston, announce that on September 15, 1917, their general offices in Madison, Wis., and their local office in the Peoples Gas Building will be removed to the Conway Building, Chicago. William F. Sloan has resumed personal charge of the Eastern office, at 14 Kilby Street, Boston, as resident partner.

J. J. HUMPHREYS, gas engineer with the McKinnon Dash Company, St. Catherine, Ont., is now on duty in Washington as captain in the Ordnance Department.

GRIFFITH W. JOHNS, for many years manager of the Boonton (N. J.) Gas Light & Improvement Company, is now manager of the Newton (N. J.) Gas & Electric Company.

ARTHUR M. BLINN, manager of the Pennsylvania Gas Company, at Erie, Pa., died recently. Mr. Blinn held the position of manager for the past four years and was in the employ of the company about ten years. He was succeeded by Frank Krum, assistant manager, who has been with the company ten years, holding the position of assistant manager about three years.

B. S. WOODMAN was recently made general manager of the New Jersey Gas & Electric Company at Dover, N. J.

J. F. BLANDY, general manager and treasurer of the General Gas Mantle Company, recently resigned. He was succeeded by J. Wysocki.

T. V. WHITTIER, formerly chief engineer of the Houghton County Gas & Coke Company, recently went to Pawtucket, R. I., to become chief engineer of the light and power plant of the Blackstone Valley Gas & Electric Company. W. B. Latimer, formerly chief engineer of the Connecticut Power Company, succeeded Mr. Whittier at Houghton.

ROBERT MONTGOMERY, manager of the commercial department of the Louisville (Ky.) Gas & Electric Company, is now at Fort Benjamin Harrison, Indianapolis, Ind. T. B. Wilson, secretary of the company, will take over the duties of commercial manager temporarily.

MARSHALL M. MILTON, manager of the Roanoke (Va.) Gas Light Company, is now captain of the Fifth Coast Artillery, located at Old Point Comfort, Va. W. J. McCorkindale, manager of the Wilmington (Del.) Gas Company, has been transferred to Roanoke temporarily.

ROSSITER S. SCOTT, formerly with the Consolidated Gas, Electric Light & Power Company at Baltimore, Md., is now captain in the Engineers' Corps, U. S. R.

H. D. JOHNSON has been made local manager of the MacThwaite Oil & Gas Company, Ada, Okla., succeeding J. C. Robertson, who is now in the service of the U. S. Army. L. H. Markman of Kansas City has accepted the position of bookkeeper.

CARL C. DEGENHARDT, formerly of the Bond Department of H. M. Byllesby & Company, has been appointed sales manager of the New York office of the company.

HOWARD MANCHESTER, who was for some time superintendent, secretary and treasurer of the Bristol County Gas & Electric Company, died Sept. 13, 1917. One of Mr. Manchester's sons, Charles H., is treasurer of the Providence (R. I.) Gas Company.

FRANK C. KEEGAN of Turners Falls, who was connected with the Amherst (Mass.) Gas Company, recently left for the military camp in Ayer.

GEORGE W. GIBSON, superintendent of the Los Angeles (Cal.) Gas & Electric Corporation, died September 3, 1917. He was in the employ of the company about twenty years. The gas company's mighty compressors and immense generators, which are never idle, were stilled for five minutes while the remains were lowered into the grave.

THE WESTMORELAND COAL COMPANY of Philadelphia, Pa., held a board of directors meeting September 18, at which the following officers were elected: George McCall, vice-president; Herman Roll, treasurer, and Howard R. Yearsley, secretary of the Westmoreland Coal Company, Penn Gas Coal Company and Manor Gas Coal Company. George B. Seyms was appointed manager of sales of each of the above companies.

Construction Notes

El Reno Company Connects 56 New Gas Customers and Will Heat Public Schools and Court House

The Oklahoma Gas & Electric Company of El Reno will furnish gas for heating the public schools of El Reno and the country court house, beginning as soon as the gas heating installations have been completed.

The company is making three short extensions of its gas mains to take on fifty-six new residence customers. The electric transmission system is being extended to supply the Fort Reno Remount depot.

Gas for 39 Hospital Buildings at Army Post

Work has been started on the gas installations for the thirty-nine hospital buildings at the American Lake Army Post, service for which will be furnished by the Tacoma (Wash.) Gas Company.

Indianapolis Main Extensions

The board of public works has directed the Citizens Gas Company of Indianapolis to construct some additional mains, and it is said that when this work is done the company will have practically completed its franchise requirements for 1917 by the laying of 35,800 ft. of new gas mains. Gas mains were ordered as follows:

In North Street, from the first alley east of Temple Avenue to Eastern Avenue; in Pratt Street, from Olney Street, to a point 190 ft. west; in Kealing Avenue, from Vermont to Michigan Streets; in Linwood Avenue, from East Michigan Street to a point 1,000 ft. north; in Goode Avenue, from Beechwood Avenue a distance of 368 ft. from the end of the present main; in East North Street, from Allen Street to a point 200 ft. east, and in Guilford Avenue, from Maple Road to Edgewood Avenue.

New Machinery at Ogden, Utah

New machinery was installed recently at the Ogden gas plant of the Utah Power & Light Company, and Superintendent Albert E. Breuerton anticipates that there will be no difficulty in securing a sufficient supply for the consumers in the future. Owing to the inability of the gas plant to supply sufficient pressure recently, there were numerous complaints, but the company assured prompt remedy of the conditions and within two weeks had the machinery installed and in operation.

Gas Extensions at Eau Claire, Wis.

Manager A. R. Manley of the Wisconsin - Minnesota Light & Power Company announced recently that the work of laying the new gas mains in the Third Ward will start soon. Operations will be begun at South Barstow Street and Grand Avenue, East.

Springfield and Spanish Fork Extension Completed by Utah Company

The Utah Valley Gas & Coke Company has completed the extension of its mains to Springville and Spanish Fork and constructed a big service system in each place to supply the users.